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BETTER FRUIT

VOLUME XIII

MAY, 1919

NUMBER 11

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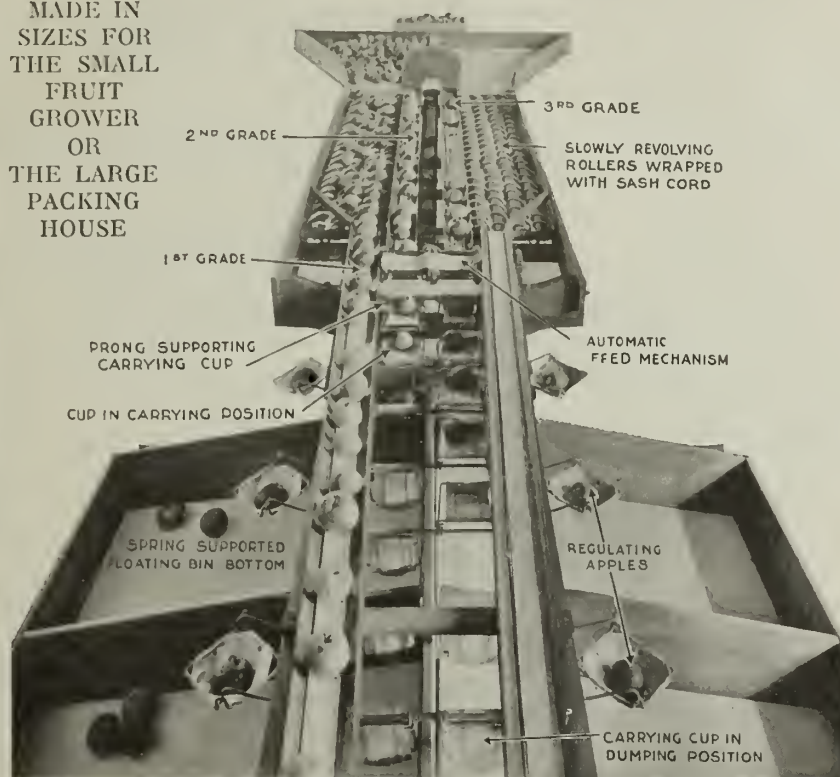


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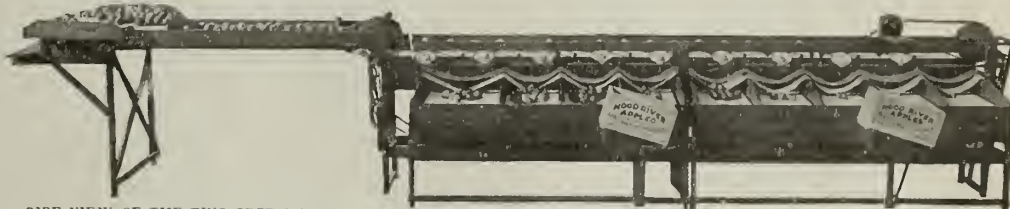
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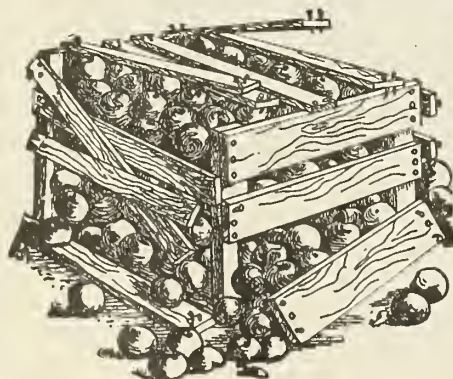
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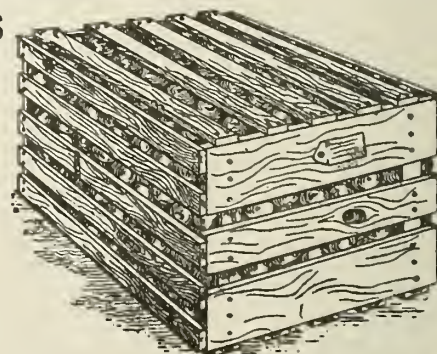
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NUMBER 11

Strawberries, King of Table Berries; How to Grow Them

Written for Better Fruit by a Practical Grower

THE strawberry season in the Northwest is almost upon us. In fact in some of the more advanced districts like Kennewick, Washington, shipping usually commences about the 10th of May unless the season is late. There is no superior strawberry grown anywhere in the world for commercial purposes than that of the Northwest on account of its shipping qualities which allow of it being transported as far east as Chicago, if occasion demands. The Northwest strawberry has proved a steady and fine income producer and the time is not far distant when acreage planted to these berries in this section will be far greater than it is now. As a table berry it has few equals and the demand for it is rapidly growing.

The strawberry is often called the poor man's berry, and justly so, as it has permitted those with limited means to invest all their capital in a piece of land, plant it to orchard and plant berries between the rows of trees. In this way the orchardist was enabled to secure a good revenue while his trees were coming into bearing. It has been estimated that strawberries in a young orchard increase the value of the land at the rate of one dollar per tree, or from \$65 to \$100 per acre. In addition to this the cultivation of the berry plants takes care of the young trees without any extra expense for their cultivation.

How to Start a Strawberry Field

In setting out a strawberry field it is sometimes difficult for a beginner to grade a piece of ground as perfectly as it should be. I would consider a piece of ground perfectly graded when you can make rills the length of your field and be able to turn the necessary amount of water in at the end of the irrigating ditch or flume without flooding any part of the field between the flume and the end of the row. It is necessary in some instances where the ground is hilly to do a great deal of grading, especially on a new piece of ground, but by all means it should be put in perfect condition before you start setting your plants, because it will be much cheaper for you and a great deal more satisfactory as well to have your field irrigate with as little labor as possible. You must bear in mind that

you leave your plants in for three or four years and the extra expense of spending an extra day or two in grading is nothing as compared to the expense of irrigating a field set to berries that is not properly graded.

I think a great deal of misconception is prevalent concerning the value of green manures to a strawberry field. These do possess a great deal of value and a proper understanding of their use in fruit growing will undoubtedly result in a great deal of benefit to the fruit grower. By green manure is meant any crop that is grown for the purpose of improving the soil and not for the crop it yields if harvested. In this sense almost any crop will serve as a green manure, yet certain crops possess a greater value than others for this purpose because they are able to obtain certain of their constituents from sources not accessible to all crops. In other words, clover is a nitrogen gatherer and can obtain the nitrogen necessary for its growth from the air as well as the soil.

Clover is a deep feeder; it sends its roots far down and gathers up and brings to the surface that which naturally exists in the subsoil, and it also lays hold of what is constantly leaking down with the water when you irrigate or is forced down by heavy rains. It gathers up escaping nitrates as well as

mineral matter, and it practically all comes to the surface again when you plow the clover under.

If the field that you are intending to plant to strawberries is naturally rich, it probably would not be necessary for you to prepare your ground by first growing a crop of clover, but in most cases it would pay you well to do so, as the year you would lose in growing the clover you will more than gain back in extra yields during the three or four fruiting seasons of your strawberry field. A field of strawberries when torn out should never be planted to berries again without first growing clover for one or two years to add humus as well as nitrogen to the soil.

In plowing a piece of clover sod, where your ground has been graded and is in good condition, it is sometimes an advantage, especially when you have a small field, to plow only one way and carry your plow back empty. You may think this is a waste of time, as it will take you twice as long to plow your field, but you must consider that when you get through plowing your field is already graded without any dead furrows, and it is very difficult to grade a piece of clover ground on account of the clover roots.

Distance for Planting

The distance for planting universally used is 30 inches between the rows and



Strawberry picking scene in the Northwest. Indian pickers.



Strawberry packing house. Loading the full crates to be taken to the shipping point.

from 12 to 15 inches between the plants in the row. This, however, should be regulated somewhat according to the strength of the soil. On poor soil the plants should be set closer, while on heavy soil they should be planted further apart, for the reason that the light soil makes a smaller plant and consequently less berries. For this reason it is necessary to plant close to get a good yield, while on heavy soil, or rich bottom land, where the plants grow to a large size, it is necessary to plant them further apart in order to give the plants room to develop and get plenty of air and light to ripen the fruit.

Setting the Plants

There are two different ways of setting the plants. One is to set the roots of the plant straight down; this the writer considers the best way. In order to set the plants with the roots straight down, the writer uses a trowel made especially for that purpose, three inches wide at the bottom, four inches at the top and six inches long. If the roots of the plants should be any longer than that the ends of the roots should be trimmed off sufficiently to spread out straight in the hole when they are planted, then the dirt should be firmed around the plants with the palms and fingers of the hands, without laying the trowel down. One man, in this way, with a boy to drop the plants, can set from 6,000 to 8,000 plants per day, or about half an acre per day.

The other way to set plants is with a hoe, with the handle sawed off to suit the convenience of the one that is doing the planting. Then he strikes the corner of the hoe in slanting under the top of the dirt and lets the probably dry and loose dirt fall down on top of the roots, crawls along, placing one knee on top of the plants and considers that he has done a good job of planting.

Cultivation

As soon as you get your plants set, cultivation should begin immediately, if in the spring and the weather is dry. This can best be done with a wheel hoe, followed with a hand hoe. Hand hoeing should simply be done to cultivate the soil between and around the plants, and it should be done in such a

manner that it will leave a loose mulch from one-half to one inch all around the plants, to keep the soil underneath moist so it will not bake and get hard.

The wheel hoeing should be done every two weeks, or after every hard rain, at least, to keep the ground from baking or forming a crust on top. It is always well to bear in mind that the better care the young plants receive the first season after they are planted, the easier it will be to take care of them as long as they are left in. Also the profitability of the field will to a certain extent depend upon the care they receive the first summer after they are set out. If you make strong healthy plants of them the first year, and give them reasonably good care thereafter, you will always have a good field. On the other hand, if they are neglected the first season and the weeds get the start of you your

plants will never amount to much. The weeds will rob the soil of the nourishment that the plant should receive and will cause you a great deal of backache and hard work for the amount of berries you will receive in return.

Irrigation

Most growers in irrigating berries irrigate too much. The practice of running water on berry fields night and day, whether they need it or not is simply one way of washing the fertility out of the soil, and this is a mistake that should be avoided, especially on sandy or gravelly soil with poorer subsoil. It should always be borne in mind that in order to make the plants do their best they should simply be kept nice and moist, but not waterlogged. Each irrigation during the summer should be followed with a cultivation as soon as the ground is sufficiently dry to cultivate nicely. This has reference to the first summer after the plants are set. After that, no cultivation is given during the blooming and fruiting season, especially if the weather is hot and the soil is sandy, as the water running through the rills will have a cooling effect upon the soil. Also it is always advisable to manage your irrigating so that you do not irrigate just ahead of the pickers.

Picking the Berries

One should, if possible, have at least part of the pickers engaged before the picking season commences and be well supplied with hand carriers. It is always well to have at least four times as many carriers as you think you will need pickers, as time is very precious during the rush, and you want the pickers to pick all they can. And when you have a large number of pickers, say about 25, all starting out on the field in



Truckload of crates ready to be placed in iced car and three open crates showing the method of packing.



A properly graded strawberry field on hilly ground.

the morning at the same time, there will always be a great number of them coming in at the same time with a carrier full. Then one should be well supplied with carriers filled with empty boxes, so the pickers will not have to wait while you empty their carriers.

Another reason why you should be well supplied with carriers is that you should have enough carriers so that you can place the full carrier on the packing tables for your packers without taking the boxes out. In this way one can mark a carrier simply by placing a card with the number or name of the picker who picked that carrier of berries in the carrier when it is brought in. Likewise when the packer packs that particular carrier one can find out whether the picker is picking according to instructions.

Berries to be just right for picking should be red on the upper side, shaded down to a very light pink on the under side. Then the berries are in the right condition for picking, and, if properly packed, will carry to the market in number one condition. All berries should be picked with the stem one-fourth of an inch long. This is done by placing the thumb and forefinger under the berry and making a slight pressure of the thumb nail against the forefinger. This will properly take the berry from the plant a great deal quicker than I can tell it. No picker should be allowed to pull or snap the berries off without a stem, as all such berries will not keep and should be discarded as culls. It is also necessary to see that the pickers pick all the berries that are ripe enough to be picked, as the next day, if the weather should be hot they will be

overripe and will have to be sorted out as such.

It is also necessary not to let the pickers set the small boxes down on the loose dirt in the field, so as to get them dirty and soiled. It is quite necessary at times also to watch the pickers to see that they do not carry the berries around in their hands or in their aprons to fill out the tops of the carriers, as this will take the gloss and shine off the berries and render them far less attractive for market.

Packing the Berries

No berries should be packed unless they are perfect in shape and firm. All long-necked and overripe and those that are too small should be sorted out, and it is always necessary to watch the packers, especially beginners, to see

that they make a solid pack and still not squeeze the berries in placing them in the top rows. The berries in the under tier of the boxes should be kept from projecting over the edge of the boxes, for if they do, when the top tier of boxes is placed in the crate they cut the edges of the berries projecting over the lower tier of boxes and make a soiled and stained looking package. The top boxes should be filled full enough so that the berries in the boxes will just about touch the cover when it is nailed on. This will keep the berries from shaking around and getting out of place while in transit. In placing the top tier in each hallock or box, berries of uniform size should be selected and packed four by four, four by five or five by five. A five by five is as small a berry as should be packed.

Growing Young Plants.

The best plants are grown from young plants. That is, fields of plants, planted the previous fall or spring. The best part of the field should be selected for plant growing, and the first and second set of runners should be trimmed off to make the plant strong and vigorous before the runners are allowed to take hold and set for young plants.

If it is desired to have the young plants ready for transplanting during the summer, say during the last of July or the first of August, it is sometimes necessary to press the young sets into moist ground sufficiently so they will stay there. In this way the plants will be ready for transplanting in from ten days to two weeks. And plants transplanted this time of the year, if the ground is in good condition, will make



An overflowing box of Clark Seedlings.



The proper way of starting to pack a box of berries. Sorting out the culls.

a good growth during the fall months and the following spring could be expected to turn off a very nice yield—from 75 to 100 crates an acre.

Profits in Berry Growing

The soil of several sections of the Northwest is particularly adapted to the successful growing of strawberries,

the most notable perhaps being that of the Hood River Valley in Oregon, and Kennewick, Washington, and some of the other districts in the latter state. The variety grown at Hood River is the Clark Seedling, and as a shipper this berry has no equal. The Clark Seedling has been grown in the Hood River Valley for over forty years, and the

writer has shipped these berries as far east as New York City by open express and had them arrive in fine condition. The other Northwest berries of this variety are also good shippers.

The profit from an acre of strawberries depends, of course, upon the yield and also to some extent on the location and climatic conditions, as the early berries bring the best price. The earliest berries in the Northwest are those raised at Kennewick and the next earliest are those grown in the Hood River Valley. These early berries frequently sell for \$8 to \$12 per crate, while the late berries average in the neighborhood of \$2 to \$2.25. The yield runs from 100 to as high as 300 crates per acre, depending largely upon the condition the soil was in when it was set to plants, and also the care they received after planting. Probably a fair average yield would be 150 crates per acre. During the last two years the price has averaged high and the indications this year are that they will bring a record-breaking price.

According to the Evaporator prunes and apricots thus far appear to be the only dried fruit for which the unusual European demand has arisen. Raisins and pears are practically dead letters in this burst of speed in the late-season market.

The government demands elaborate packing of dried fruits for overseas shipment. All cases must be bound with iron and marked on all four sides and end with a quartermaster's stamp.

Possible Cause of "Sour Sap" in the Pacific Northwest

By A. B. Cordley, Director Oregon Agricultural College Experiment Station

ONE of the most important pathological conditions of fruit trees in the humid sections of the Pacific Northwest is commonly known as "winter kill" or "sour sap." The nature of the injury and the time at which it occurs suggests the designation "spring injury."

Spring injury occurs throughout the humid sections of the Pacific Northwest at least. I have had it under casual observation for many years and have personally noted it as far south as Grants Pass and as far north as one hundred miles north of Victoria, B. C. The extent and importance of the injury varies with the locality and the season; but nearly every year—if not every year—the injury is serious in some or all parts of the territory mentioned. Its importance is indicated by the fact that last spring a seventy-acre pear orchard loaded with fruit spurs and with a ten to fifteen thousand dollar crop in sight, was so badly injured that less than three hundred bushels of fruit were sold. Moreover, the entire orchard, which should be worth six or seven hundred dollars per acre, has been so impaired by several attacks of spring injury that it is now, when ten years of age, inventoried by the owners at two hundred and fifty dollars per acre. The loss in value of crop and of orchard in this one instance has been,

to date, not less than twenty-five to thirty thousand dollars. Many thousand acres of orchard have suffered in like degree.

Spring injury is most serious in orchards planted upon heavy clay or clay loam soil, with poor air and water drainage, but it may be serious in orchards planted on thin or gravelly soils upon hillsides, especially if there is a gravel subsoil and where both air and water drainage are excellent. A particularly discouraging characteristic of the disease is that frequently the largest, most vigorous and evidently most healthy trees suffer the most serious injury. Another characteristic is that the greatest injury occurs during the periods of greatest vegetative activity in the life of the tree, viz., from a short time before the blossoming period to three or four weeks after; and during the first ten or fifteen years of its life.

The first indication of injury is a slight discoloration of the cambium. With continued unfavorable conditions this discoloration becomes more and more noticeable; the tree, though it may bloom profusely, fails to set fruit, the leaves may wither and fall, twigs or branches may die, and even the entire tree may be killed to the ground. In older trees the only indication of injury may be a partial or total failure

to set fruit, although the tree may bloom profusely.

Several theories have been advanced to account for "spring injury." The fact that it is most serious to trees growing in heavy, poorly drained clay soils has led to the very common belief that the roots have in some manner been injured by excess of water or by a deficiency of available oxygen. That this is not a satisfactory explanation is indicated by the fact that the injury may occur upon well drained hillsides and by the vigorous growth which usually follows the return of favorable weather conditions.

The theory of "frost injury" has also been advanced to account for "spring injury." To my mind it is not satisfactory, although frost may be, in exceptional cases, a contributing factor. Serious spring injury certainly occurs when it could not possibly be due to frost injury; and even in those cases where frost injury might be considered a contributing factor the injury is much more serious than would be caused by even lower temperatures outside the humid belt. For instance, the pear crop was ruined, a large portion of the trees were injured and many trees were killed to the ground last spring in the Corvallis Orchard Company's orchard. Unfortunately no records of

Continued on page 30.

Growing the Red Raspberry in the Puyallup Valley

By Harold D. Foster, Sumner, Washington

THE Puyallup Valley of Western Washington is an extensive producer of small fruits, and is particularly noted for the high quality of its red raspberries. There are several varieties of raspberries grown: the Cuthbert, Antwerp, Marlboro, King, St. Regis and one or two others. The Cuthbert raspberry is the most extensively grown, and the other varieties in the order listed. The Cuthbert

per pound in the Puyallup Valley, while buyers bought raspberries at different Oregon points for 5 to 8 cents per pound.

The raspberry prefers a well drained rather light soil, although good crops are produced on the heavier types of soil if the drainage is good. The matter of good drainage is very important, as the raspberry will not stand a poorly drained soil.

canes as they grow, keeping them upright and out of the way of the pickers. As the growers of raspberries know, new canes grow up from the hill every year and bear fruit the following year.

In our valley the new canes grow from 6 to 9 feet in height, and from 5 to 8 canes are left in the hill to bear fruit the following year. During the winter or early spring the dead canes which bore fruit the previous year are cut away and the new canes are woven or tied along the center wire at a height of from 4 to 5 feet. This brings the raspberries at a convenient height to pick so that little stooping is required.

The raspberry is a heavy feeder on the plant food in the soil, and to produce good crops, a heavy application of fertilizer is required at least every other year. Ten to fifteen tons of stable manure to the acre produces good results. Different kinds of commercial fertilizer are also being tried. As to results, from 400 to 750 crates of berries to the acre are common yields, and this will net the grower from \$500 to \$1,000 per acre.

The Puyallup Valley is situated between Seattle and Tacoma and the growers are able to get plenty of pickers each summer from these cities to harvest the crop. The raspberry picking starts from June 15 to July 5, and continues about six weeks. Parties of women and girls and families consisting of the mother and children of 10 to 18 years make the best pickers. Picking berries is not a man's job, and men and older boys do not make good pickers. The pickers are paid by the crate, consisting of 24 pint cups, and are able to earn from \$1 to \$3 per day, although about \$1.50 is the average day's pay. Families of mother and children are often able to return to the city with from \$150 to \$200 above their expenses for the month's work. The growers furnish the pickers with comfortable houses or tents furnished with a stove,



Showing Red Raspberry field at Riverbend Farm about June first, with new canes three to four feet high and picking time about two weeks off. This is an excellent example of one of the fine berry fields in the Puyallup Valley. This field produced 750 crates per acre during season 1918.

Red Raspberry is much preferred by the cannery, as it holds its texture well in the canning process, and because of its sweet flavor is known as the "sweet berry." The Antwerp and Marlboro have a more acid flavor and are called the "sour berries" by the canners. Also the Cuthbert raspberry is an excellent shipping berry and the last pickings are as firm and sound from a shipping standpoint as are the first pickings. This is not true of the Antwerp, Marlboro, etc., which are unfit to ship toward the end of the picking season and have to be turned into the cannery for juice or jam making.

The growers of the Puyallup Valley through their marketing agency, The Puyallup and Sumner Fruit Growers' Association, are extensive shippers of fresh raspberries, blackberries, etc., to the territory throughout the upper Mississippi Valley, including the States of Montana, the Dakotas, Minnesota, Iowa, Nebraska and Kansas. Cars of fresh raspberries arrive in good condition as far east as Detroit and north to Winnipeg, Canada. Working in close cooperation with the fruit growers' association is the Puyallup and Sumner Fruit Growers' Canning Co., a \$600,000 corporation, whose policies are controlled by the growers themselves. So successful have the fruit growers' association and canning company been in realizing good prices for the producers that outside buyers of fruit are forced to pay double for the fruit of the Puyallup Valley, in comparison with what is paid elsewhere. For instance, last season (1918) raspberries brought 12 cents

In planting we set the raspberries in rows 6 to 8 feet wide with the plants from 2 to 3 feet apart in the row. The rows may run north and south or east and west, although with the rows running north and south most of the fruit seems to set on the east side of the row and the new canes grow up on the west side of the row, making it easier for the pickers to harvest the berries. Heavy posts are set at either end of the row, with lighter posts at intervals of about 20 feet, and on these posts are stretched three wires. The fruiting canes are woven or tied on the center wire and the two outside wires support the new



Cuthbert Red Raspberry field taken May 15, at Riverbend Farm, in Puyallup Valley, Washington.



Red Raspberry field in winter, showing the dead canes removed at the left and the new canes woven on wire. The scene at the right shows the dead canes on which the past season's crop was raised and the new canes upright. Note the height of the new canes, which is 6 to 8 feet.

table, spring beds and clean straw-filled ticks, also with wood and water. It pays to have as good accommodations as possible, as a better class of pickers are secured and they are more apt to stay throughout the season.

When the pickers start their work they are given a waist carrier, which ties around the waist, holding two cups, and a hand carrier holding six cups. Each picker is assigned a row in the field and told by the field boss just how to pick the berries. The pickers are required to clean the row of the ripe berries at each picking; this is necessary to keep the berries ripening well, because if some berries are left on the vines they become over-ripe and draw the nutriment from the vine to ripen the seeds, making the green berries ripen more slowly. Receiving sheds are located conveniently throughout the

fields, so the pickers do not have too far to carry their berries. It is the aim to get the berries into the shed and out of the heat as soon as possible, especially if the berries are to be shipped. At the receiving shed the berries are packed in crates and then hauled twice and three times a day to the shipping station or canneries, located both in Sumner and Puyallup.

As a whole the business of growing raspberries is quite satisfactory. Where the soil is right and proper attention is paid to cultivation and fertilization, large yields are obtained. With a strong fruit growers' association maintaining the markets for fresh fruits and a canning company which uses the overripe and surplus fruit at good prices, the Puyallup Valley grower is more fortunately situated than the growers of fruit in most other sections.

Discusses Winter Pruning vs. Summer Pruning

By M. Mitra, Ohio State University, Department of Horticulture

IN a recent article on pruning published in the February issue of *BETTER FRUIT*, Professor C. I. Lewis of the Oregon Agricultural College has very ably discussed the various phases of efficiency in pruning in relation to food materials (carbohydrates and soil nutrients) so as to maintain a balance between the vegetative growth and fruit bearing of trees. Dealing with the question of pruning, Professor Lewis is rather inclined to urge a judicious summer pruning instead of winter pruning, which has been found to be satisfactory under the Oregon condition. Of course, it is useless to establish a hard and fast rule for pruning, which must necessarily be done in consideration of the variety of fruit trees and the locality in particular as need be, but in regard to the season of pruning, it seems, we must adopt a practice that will cause minimum loss of plant-storage food with an optimum amount of vegetative growth and fruit bearing on a balanced ratio. In order to bring a state of equilibrium between these two factors, the season of pruning is of utmost importance. In dealing with the subject of pruning on the

basis of food materials in plants one must understand at first the basic principle of the translocation of food materials within the trees, especially the carbohydrates, both in the dormant and growing season.

It has been found by experiment on the trees under natural condition from October, 1918, to March, 1919, that the carbohydrate materials (starch and sugar) in plants move in a cycle, as it were, during these six months. For this purpose both seedlings and large bearing apple trees and a few others, situated under the same condition in an orchard of the Ohio State University campus were studied. To state briefly, it has been definitely found that the so-called storage organs, as the apple fruit spurs, are not the real storage organs of the apple trees, although they might accumulate starch for a time during the growing season of the tree. It is partly owing to the change of temperature that a translocation of carbohydrates occurs which differs materially both in the dormant and growing season of the trees.

At the beginning of the fall season, especially in the latter part of October

when the trees shed their leaves, the starch granules are found in abundance in the fruit spurs and stems. But as the temperature lowers by the latter part of November, the starch granules begin to disappear until by the early part of January only a trace of starch is left. This has been found by microchemical test and also by quantitative analysis both in the seedlings and growing apple trees. Tests on the roots of the same have shown the presence of abundance of starch in both cases all throughout the dormant period.

This seasonal disappearance of starch from stems and spurs brings forth an open question of three possibilities for the disposal of starch by the plant during its dormant condition. After hydrolization by enzymic action the starch is either utilized by the plant itself as a result of metabolic process or it is translocated to the thick stems and roots and change to starch therein until the flow of sap begins, when it is again hydrolized to sugar and comes up with the soil nutrients or it is partly utilized by metabolism and partly stored in the stems and roots. (This is the main object of study of the writer at present.) Microchemical test has always shown less quantity of starch and sugar in the spurs than in the roots all throughout the dormant period. Whatever it may be in any case during the latter part of the dormant season, the carbohydrate food material (starch) is found to be lacking in the upper part of the tree. At the beginning of the spring season when the soil nutrient rushes up to the upper part it takes up with it a considerable amount of sugar which is the product of enzymic hydrolysis at the roots. The translocation of sugar from the roots to the upper part of the tree is the most pronounced in the sugar maple, which is caused by a favorable weather condition for these typical trees.

A similar phenomenon of the change of starch to sugar in relation to the temperature has been found by Hasselbring and Hawkins (*U. S. D. A. Jour. Agri. Res.* 3, 1915) in the storage experiment of sweet potatoes. It was found that in sweet potatoes stored at a lower temperature there is a gradual disappearance of starch from October to March and a reformation of the same from March to June. Here the changes of starch to cane sugar and vice versa are correlated with the seasonal changes in the temperature.

During the growing period when the leaves come out new carbohydrate material is formed by them and the starch begins to show again in the stem and buds, as is evidenced in some of the ornamental shrubs at present, which completely lost their starch during the dormant period. All throughout this growing period of the tree the starch granules are found to be distributed all around the plant organs, more or less, until the next fall.

The above discussion clearly points to the fact that during the dormant season there is the minimum amount of carbohydrate materials (starch and

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Lime-Sulphur Summer Spray for Apple Scab

By C. C. Vincent, Horticulturist, University of Idaho, Moscow

WHILE the apple scab is unknown at present in the fruit districts of Southern Idaho, it is quite prevalent in the fruit sections of Northern Idaho, where the rainfall is from 18 to 25 inches per year. In fact the apple scab is probably the most serious fungus disease with which the fruit grower in Northern Idaho has to contend. This loss is far greater in these districts than is generally appreciated by the majority of the growers.

In many of the unsprayed orchards from 10 to 75 per cent of the crop is unfit for sale due to the presence of the scab fungus. Financially this is a distinct loss to the growers, for under the provisions of the State Horticultural Laws of Idaho, it is a violation of the law to place upon the market scab-infected fruit. Aside from the losses which may occur in the reduction of the quality of marketable fruit other losses of scarcely less importance may result, such as premature dropping of apples, reduction in the size of the fruit, dropping of scabby apples before picking, impairing the health and vigor of the trees, etc.

The ever-increasing difficulty of many of our growers to control the apple scab caused the Horticultural Department of the University of Idaho to carry on experiments to determine a safe and effective method of control. The schedule adopted was as follows:

(1) To ascertain the value of lime-sulphur as a summer spray for scab.
(2) To determine the number of applications needed to hold the scab in check when applied according to the following schedule:

1. When the blossom buds show pink.
2. When the petals fall.
3. Three weeks after the petals fall.

To control the codling moth, arsenate of lead was added to the second and third application. The lime-sulphur used in making these tests was diluted according to the following table:

TABLE I

Reading of Hydrometer		Amount of Dilution. Number gallons water to one gallon lime-sulphur solution	
Degrees Baume	Specific Gravity	Winter Spray 5° Baume	Summer Spray 1° Baume
34	1.306	8¾	43¾
32	1.283	8	40
30	1.261	7¼	36¼
28	1.239	6½	32¾
26	1.213	5¾	29½
24	1.198	5	26
22	1.179	4¼	22¾
20	1.160	3½	19¾
16	1.124	2½	15

A THREE-YEAR AVERAGE OF SPRAYING TESTS SHOWS THE FOLLOWING RESULTS

TABLE II—RESULTS OF SPRAYING WAGENERS

Materials	Applications	Time of Applications*	Total Apples Counted	Per Cent Scabby	Per Cent Sound
Lime-sulphur	Check		4445	58	42
Lime-sulphur and A/L	One	First	4729	27	73
Lime-sulphur and A/L	Two	First and second	8263	11	89
	Three	First, second and third	5620	6	94

*Applications made according to above schedule.

TABLE III—RESULTS OF SPRAYING JONATHANS

Materials	Applications	Time of Applications	Total Apples Counted	Per Cent Scabby	Per Cent Sound
Lime-sulphur	Check		1910	52	48
Lime-sulphur and A/L	One	First	2630	29	71
Lime-sulphur and A/L	Two	First and second	3537	17	83
	Three	First, second and third	10243	7	93

TABLE IV—RESULTS OF SPRAYING ROMES

Materials	Applications	Time of Applications	Total Apples Counted	Per Cent Scabby	Per Cent Sound
Lime-sulphur	Check		1274	48	52
Lime-sulphur	One	First	1892	42	58
Lime-sulphur	Two	First and second	3779	28	72
	Three	First, second and third	4460	17	83

TABLE V—RESULTS OF SPRAYING GRIMES

Materials	Applications	Time of Applications	Total Apples Counted	Per Cent Scabby	Per Cent Sound
Lime-sulphur	Check		8256	24	76
Lime-sulphur and A/L	One	First	15578	4	96
Lime-sulphur and A/L	Two	First and second	19903	3	97
	Three	First, second and third	7021	1	99

A study of the above data would indicate, therefore, that with most varieties, one and two applications of lime-sulphur are not sufficient to hold the fungus in check. The Grimes, however, seems to be quite resistant to scab infections, hence one application made at the time the buds are showing pink should reduce the fungus to a negligible quantity. I am led to this conclusion by data secured during the three-year period.

Three applications of lime-sulphur reduced the infection on Wageners from 58 per cent in the check plot to

6 per cent; Jonathans from 52 per cent to 7 per cent; Romes from 48 per cent to 17 per cent; Grimes from 24 per cent to 1 per cent. A fourth application of lime-sulphur made nine weeks after the petals fall for one year only gave the following results: On Wageners, same result as when three applications were made. Grimes Golden, no reduction over three applications; Rome, reduced from 30 per cent to 21 per cent; and Jonathan from 9 to 8 per cent. The fourth application is not necessary, therefore, on such varieties as Wagener, Jonathan and Grimes. Should rainy weather continue throughout the sum-

mer, this application might be necessary. To reduce the scab infection on the Rome to a minimum, four applications are necessary under normal conditions.

In view of the fact that many of the scab spores winter over on fallen leaves, etc., I would suggest that sanitary measures be followed, as it will assist materially in the spraying operations. To lessen, therefore, the danger from primary infection, fallen leaves should be plowed in the fall or early spring, rotten apples and dead branches

Continued on page 24.



FIGURE 1—Showing characteristic scab spots on the fruit.



6 per cent scabby. 94 per cent clean.
FIGURE 2—Results with three applications of lime-sulphur.
Wagener variety

Future Prospects for Markets for Our Apples Abroad

By Arthur M. Geary, Portland, Oregon

A VISIT in the different fruit-growing districts of the Northwest is convincing as to the abundant optimism, that the high prices of the last season has spread among growers and shippers. The optimism is somewhat "sicklied o'er with a pale cast of thought," caused by the threatened radical advance in freight and icing charges upon shipments of fruit from the Pacific Northwest, but the optimism nevertheless remains, although in somewhat of a more dormant state than would otherwise be the case.

The eager interest that the marketmen of the eastern part of the United States and of England are displaying regarding the future of the box-apple business is encouraging support to the hope that the optimism of the growers is well founded.

While on duty in England prior to going to France, I had a short leave in London and spent a little time in Covent Gardens, talking to the leading importers of fruits and produce. At that time all interest centered in the war. Many of the fruitmen had sons who were doing their bit upon the battlefields of France. The embargo upon shipments of fruits from America had been long in effect and was a measure that foreign and home fruitmen were in sympathy with.

The situation was quite different a few months later, when the armistice was signed, the embargo lifted and a limited supply of boxed and barreled apples was arriving in England.

There was a mad scramble for the limited offering and the demand for high-class American fruit seemed almost without limit. A few New York firms that rushed overseas with shipments of Extra Fancy box apples, paying as high as \$2.00 a box freight, did not realize the profits contemplated. The maximum price of about a pound a box reduced the profits that could be realized upon Extra Fancy and Fancy grades of high class box apples from the Northwest. C Grade Newtown Pippin apples from Watsonville, California, brought the maximum price and sold for the same figures, no more and no less than that received for the best grades and varieties of Northwestern box apples, a condition never before known.

The shipping of apples to England for the first few months after the armistice was signed was curtailed by lack of refrigerated space upon the big liners going to England. The White Star and Cunard lines endeavored to be fair by allotting space according to the amount used in years before the embargo. Accordingly such firms as Simons, Shuttleworth & French Company obtained a lion's share of the space, this particular firm having on most of the liners one-fourth of the refrigerated space reserved for apples. Denmark, Holland, Norway and Sweden, with the signing of the armistice, came forward with an urgent demand for apples and Copenhagen did much sailing to the

well-known English distributing importers and to the exporters in New York.

The apples sent to France during the first year that the United States was in the war, were greatly appreciated by the soldiers, and I often heard in France the hope expressed that more apples would be forthcoming. No such shipments had materialized, however, at the time I left France in the latter part of December and American apples were unavailable at any price.

A word might be said in passing, that the English and French apples were

found by the soldiers to be fully as miserable and serawny as reputation led us to expect. The English crop of apples, such as it was, was very light last season. I paid sixpence, or about ten cents, for a seabby apple that would not even have been used for cider in this country. Prices for apples in France were nearly as high and were of an equally low grade.

In a number of the larger towns and cities of France, I interviewed the fruit and produce merchants, asking where they procured such imported fruits as oranges, lemons and grapes. The answer invariably was, through a mail-order system conducted with merchants in Italy and Spain. Later the consul at Brest confirmed the information that I had received and stated that there was no distribution system for fruits in France. Mr. Wayne M. French, the American representative of Simons, Shuttleworth & French, upon my arriving in New York, told me that his firm had shipped apples to Paris in years past, but that the fruit received no adequate distribution and that the charges had proven conservative.

The American Express Company has established branch offices in those parts of France where American troops are, or have been, and it appears to me that such an organization could do much towards distributing fruits from some center in France. France is an agricultural and horticultural country and believes in patronizing home industry; but there is undoubtedly a latent demand among the wealthier classes for the fancy apples that can be grown in the Pacific Northwest. Then, too, France is to be the mecca of hundreds of thousands of tourists and still is at this time the sojourning place for hundreds of thousands of English and American troops. These all are fond of high-class apples, such as cannot be grown in Europe and which are only being grown to perfection in the celebrated districts of the Pacific Northwest.

When the allied armies swept back the Germans in the fighting that preceded the armistice, almost immediately a pilgrimage of French women and old men began through the battlefields, the purpose being to find the graves of sons, husbands and brothers that had fallen. The immensity of this pilgrimage which has begun and which will be participated in by people from all the allied countries, cannot be overlooked in the seeking of additional markets for Northwestern box apples.

During the coming year the world will be in a transitory state and no one can predict with any degree of certainty as to what will be the effect of conditions upon the box-apple market. But taking a longer look into the future, there appears to be full ground for the abundant optimism of the fruit growers and shippers of the Northwest.

The markets of this country have been developed during the period of the

Continued on page 24.



LIEUTENANT ARTHUR M. GEARY

[Editor's Note.—Mr. Geary, who was formerly identified with the apple industry both in the Northwest and in the big markets of the East, resides in Portland, Oregon. He was graduated from the second reserve officers' training camp at San Francisco, California, receiving the rank of second lieutenant, and was assigned to the aviation section and became assistant executive officer at Kelly Field, San Antonio, Texas. In July, 1918, he went overseas, where he was made executive officer in the American Air Service at the concentration camp at Winchester, England. Later he became instructor at the aviation school at St. Maixent, France, and also at the American Air Service headquarters at Tours. In December he was promoted to first lieutenant and ordered home. It was while he was in the service abroad that Mr. Geary made the observations on the apple situation in Europe contained in this article.]

Smudging Saves Fruit Crop in the Frost Belt



Smudging method employed in orchard to prevent frost from damaging fruit buds. This is what is known as the thermostat system. This instrument, which can be seen on the pole, gives the signal when the temperature drops down to the danger point. The smudge pots are then lighted.

DURING the early part of April frosts that were slightly damaging were reported from a number of the Northwest fruit-growing districts, and for the first time this season smudging was commenced. For several days orchardmen were busy watching the local weather conditions, and kept the smudge pots set out and all ready to be fired up. It is announced, however, that frost has so far done very little damage to Northwest fruit crops.

At Medford and in the immediate vicinity the temperature dropped down to 29 degrees and in the more northern sections of the Rogue River Valley the thermometer recorded a degree or two lower. As orchardmen had already been notified by Frost Expert Young that they could expect a considerable drop in temperature they were pre-

pared and took the proper precautions.

County Agent Cate of Jackson County reports that he does not expect any further damage from frost in that section. In view, however, of the very heavy budding of trees he says that many of the buds could have been frost bitten without its affecting the general crop. Not in many years has there been prospects of so large a crop in the orchards in Jackson County as at the present time and many of the orchardmen there are predicting a crop of 2,500 cars. While heavy late frost would put somewhat of a damper on this fine outlook, it is expected that the Medford district will now get by in good shape by carefully watching weather conditions and keeping the smudge pots going if necessary.

What They Are Doing in Fruit in California

HUMBOLDT COUNTY, for a long time recognized as one of the districts which produces the best apples that are grown in California, will this year enter the deciduous fruit industry on a basis of systematized production, grade and pack. The deciduous crop raised in Humboldt County is largely apples and fruit of very excellent quality has been produced there. This year the growers for the first time will make a concerted effort to place their fruit on the market properly, and a standard Humboldt County pack and label have been adopted. Reports from there also state that large acreages are being planted to young trees this spring and that ultimately it is expected that this county will become one of the leading apple-producing sections on the Coast.

A situation that is now puzzling the wine-grape growers of California is what to do with the expected crop this year. Last year California grapemen

shipped 6,000 cars of wine grapes, which were used for various purposes, but what the situation will be this year nobody in the grape business in California will attempt to answer. In the meantime reports are to the effect that there is every promise of an abundant crop, just as if nation-wide prohibition had never been heard of, and wine-grape growers are asking a good, healthy price for them, although there has been little contracting for crops so far.

An irrigation system in Madera and Merced counties that will irrigate 10,000 acres of land is now being constructed. The water will be taken from a big reservoir on the Chowchilla River. The land which is now in grain will be subdivided into small tracts and set to fruit.

One of the largest single settings of pomegranates ever made in California

has been set out at Woodlake by the McClure Brothers. The acreage that will be set to this Oriental fruit is ten and other settings of still greater size are expected to be made in this section.

To help rid Tulare County of ground squirrels the supervisors of that county have supplied ranchers with 23 tons of poisoned barley, 16,000 gallons of carbon bisulphide and 1,000,000 gas balls since last August.

Having made a big success of growing apricots, Kern County, it is now reported will soon go into the cantaloupe industry on a big scale, as 300 acres of melons will be planted near Shafter this year. It is expected to market the Kern County melons in the gap between the coming of the crops in the Imperial and Turlock districts.

Eighty dollars per ton for peaches, as against sixty dollars per ton last year, is now being offered to growers for their crops in the Santa Clara Valley.

Some idea of the demand for California figs may be obtained from the fact that E. Bruml of Hughson, who has four acres in this fruit, has already been paid \$3,000 for his crop several months in advance of its maturity, and that all the owner has to do to comply with the conditions of the sale is to cultivate and give his orchard one irrigation.

The Portersville section of California reports a species of winter pear that shows special qualifications to resist blight, and under proper conditions may be stored for weeks. According to the report this new pear gives promise of being an important addition to the orchard business of this particular district.

In the number of vines or trees set out in Merced County this spring, grapes lead all other plantings, according to the county horticultural commissioner, while almonds, peaches and figs occupy the next three places on the list. The total number of all trees and vines set out in the county this season is 115,641.

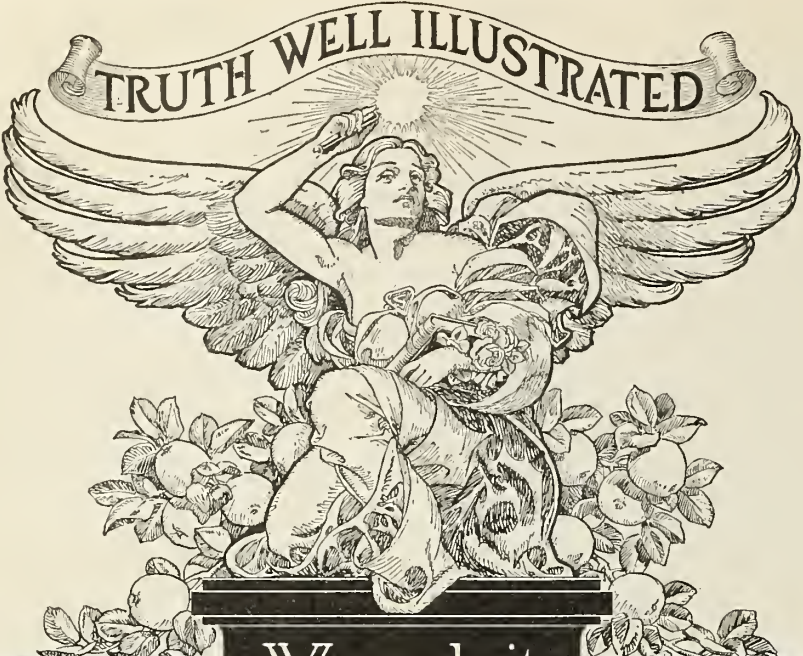
Of 1,000 acres of fruit and nut trees planted in the Oakdale district in Fresno County this year the bulk of the plantings have been almonds, although 300 to 400 acres of figs have also been set out by Fresno County growers this spring.

Two thousand acres of watermelons will be raised in one district in California this year. Seventy-five per cent of the crop from this acreage, it is expected, will be marketed within the borders of the state.

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lasts from five to six weeks of steady work. Coming at this time of year the loganberry is less liable to be hit by frost than the strawberry and it comes at just the right time to secure pickers. By the 20th of June summer has arrived and city people are commencing to think of going to the country for their annual outing. The city schools are also generally out by this time, making it possible to get a much larger force to help harvest the crop. In many instances whole families come to the loganberry fields, where they get six weeks of good, healthy outdoor labor as well as make quite a substantial income.

In the near future the planting of the loganberry will be very extensive, and present indications are that it will prove to be one of the largest factors in the small-fruit business in the Northwest. Now that its excellence has become so generally known the demand for the loganberry has come to stay.

Preparing for a Busy Season

A busy institution in the fruit industry just now are the various plants of the Northwest Products Company located at Salem, Oregon. In addition to its factory for manufacturing and bottling the well known fruit-juice drinks, "Loju" and "Phez," made from loganberries, and "Appleju," made from apples, this company has recently established a large plant for the making of jams, jellies and preserves. Raspberries, blackberries, strawberries and cherries will be used in large quantities at the new plant as well as tons of apples and other fruits. In order to handle the increased output this season the company is installing an additional battery of cookers, bottling equipment and other apparatus. In addition to the plant at Salem the Northwest Products Company will operate a juice-pressing plant at Woodburn, and expects to receive shipments of fruit from many points throughout the Willamette Valley.

Loganberry Coming Berry for the Northwest

By J. P. Aspinwall, Brooks, Oregon

I BELIEVE the loganberry is the coming berry for the Pacific Northwest to grow and for the world to use. One of the great features of the loganberry is that it is adaptable to so many purposes, all of which are profitable to the user. There is no berry that lends itself more generally to by-products purposes and the various drinks manufactured from its juice are admitted to be the finest fruit-juice drinks placed on the market. In affording the loganberry grower part at least of his income from this berry the manufacture of its juice into beverages is assuming large proportions. For jelly, jams and in other forms that it is now being so extensively used by the by-product plant or canner the loganberry has few, if any, equals.

The loganberry ripens at the same time of the year as the native blackberry of Oregon and is the heaviest producer, where the vines are given the proper attention, of any of the berry family. The first loganberries

are ready to pick from about the 20th to the 25th of June and the picking



Gathering the Loganberry crop on the Aspinwall place at Brooks, in Willamette Valley, Oregon.

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The photographs reproduced on this page show the **CLEVELAND** at work in an orchard. Boys derive pleasure as well as knowledge working with **CLEVELAND TRACTORS**.

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These Well Known Pacific Northwest Fruit Growers Have Recently Bought Clevelands

After making tests of the **CLEVELAND** on soft, steep, sliding hillsides pulling full capacity loads, and observing the demonstration of the **CLEVELAND** at Walla Walla, pulling its full capacity load on the steepest grades, the following well known orchardists have purchased **CLEVELANDS**:

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Wittenberg-King Co., Portland, Oregon	W. R. Reith, Sheridan, Oregon
Charles Brown, Brush Prairie, Washington	Holland-Washington Mortgage Co., Portland, Ore.
Chumstick Orchard Co., Everett, Washington	Columbia-Okanogan Orchard Co., Brewster, Wash.

and others. Write for catalogs and prices.

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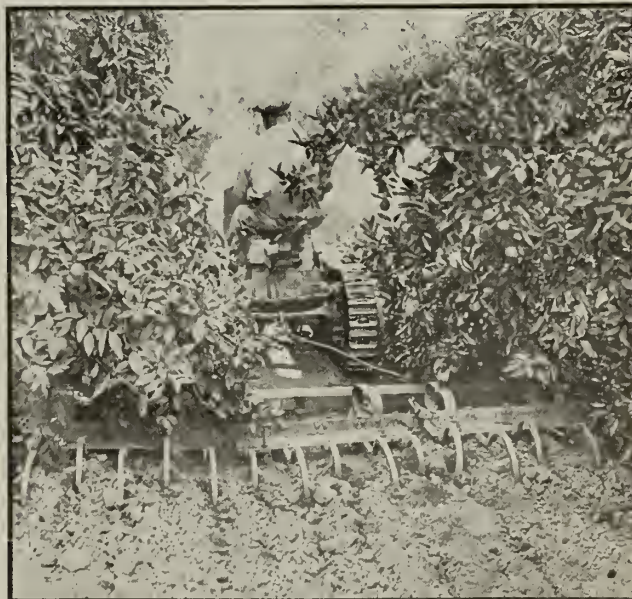
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Dudley Building, YAKIMA, WASHINGTON

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Cleveland Tractor with three-gang goose-neck harrow cultivating 7 inches deep between trees



Rear view of same Cleveland shown at left

BETTER FRUIT

An Illustrated Magazine Devoted to the Interests
of Modern Fruit Growing and Marketing.
Published Monthly
by

Better Fruit Publishing Company

703 Oregonian Building
PORTLAND, OREGON

The Co-operative Association.

With the coming of the readjustment and rejuvenation of the fruit industry indications are not lacking that co-operation and organization among the growers of the Northwest, which, with few exceptions, has been in either a dormant or backsliding stage during the past few years, is again coming to the front. In the scramble to market his fruit for several years, due to adverse conditions, the fruit grower in many instances disregarded the great factor that made the business a success for him originally. Relieved of his worry over the outlook for the future he is now seeing that organization and co-operation were the real points of refuge that carried him through the troublous times.

The standard of pack and grading, laws governing defective fruit, advantages in marketing and shipping and other beneficial things which have proved to be the backbone of successful fruit raising were all to a large extent secured through organization—through the co-operative association or union, and it looks now as if the slogan of the fruit grower is, or soon will be, "Back to the co-operative association."

Our Horticulturists.

The time has not been so very distant when the work being done by the expert horticulturist was not looked upon by the fruit grower as being of any great value. The problems confronting the grower were many and because they couldn't be solved or a remedy provided almost immediately the grower in many instances became impatient and cynical. He could observe the bad effects of pests and tree diseases on his fruit crop but he often couldn't discover the cause, and if he did was unable to provide a remedy. Following the old-time practices of doctoring an orchard he secured very little if any beneficial results. The scoffing grower didn't take into consideration that it takes time, organization and investigation of a most rigorous nature to secure these results. And he also failed to consider that the establishment of experimental work in horticulture in the Northwest was comparatively in its early stages.

Now, however, the trend of opinion has completely changed. The successful work done by the intelligent body of men who have had charge of solving the problems of the fruit grower throughout the Northwest has made itself so apparent to even the most obtuse orchardman or fruit grower in other lines that he is willing to rise up and call the "professor" blessed. Of course the expert has not solved all the problems, yet—but he has solved many

of them and has organized and systematized his efforts so thoroughly that he is able to cope with almost any situation. Painstaking research work has provided him with the necessary information to grapple with new problems as they arise. More adequate equipment to assist him in his work has been provided, and last and perhaps not least, he is being given the true appreciation and co-operation of the men that he is helping.

While the fruit grower became discouraged during the lean years and in many instances neglected his orchard or fruit farm, the horticulturist went on his way keeping everlastingly at it; and it is not too much to say—that now that a new era has dawned for the fruitman most of his success in the future will be due to the fine work of the expert who has provided him with new ideas, new methods, new weapons and new remedies with which to reach the goal of success in fruit growing.

The War and the Fruit Industry.

According to well informed and close observers of the fruit industry, although the war had a disturbing effect on the industry and almost entirely cut off foreign markets until the latter part of 1918, this fact was to a large extent a blessing. Turned away from the big markets abroad it was necessary to find a wider market for American fruit at home and the market was found. It is stated by fruit experts that never in the history of the deciduous fruit business was there such a wide distribution of apples and pears in home markets as in 1918, and the demand, in these new markets, it is declared, has come to stay. While many of the points that were reached had been receiving supplies of inferior fruit, little if any effort had been made to furnish them with high quality stock. It was found that in almost every city of 10,000 population or more that there was a market for a certain quantity of fruit of the finest quality and that the better class of buyers, once having obtained fruit that was perfect, are now insistent on getting it in the future.

It is this wider market at home as well as the opening of the foreign markets abroad that is causing the Government Information Bureau and others who have studied the question to advise the further planting of apples and pears and to predict an increasing market for the future.

A Correction.

Through one of those unavoidable errors that will sometimes occur in the best regulated publications a cut representing a page advertisement carried by the Yakima Fruit Growers' Association in the Saturday Evening Post during 1918 was credited to the Yakima Horticultural Union. Desiring to have the press matter that it puts before its readers accurate at all times BETTER FRUIT acknowledges and corrects the mistake in this issue.

Aphides.

Once there was some little aphides
Just as small as they could be,
And they went to eating foliage,
All there was upon a tree.

And when all the leaves had vanished
They moved to another one,
And they only left the branches
As they scampered in the sun.

Millions of them kept on coming
As the days grew warm and bright.
As their numbers kept increasing
They ate all green stuff in sight.

They destroyed all kind of plant life
And they feasted on the grain;
In their path they left destruction
Until the ladybugs came.

They walked right up to those aphides
With no introduction planned,
And when they had finished with them
There were no more in the land.

—O. O. Smith.

Keeping ladybugs in cold storage through the winter to commence a spring offensive against the army of aphides is a new idea, but Horticultural Inspector C. B. Wood of Yakima, Washington, is sure it will be effective. Last fall six pounds of ladybugs, numbering approximately 200,000, were collected in the Walla Walla district and as soon as they are thawed out will be planted in the various parts of the Yakima Valley to wage war on the nimble and voracious aphide. The thawing operation will be conducted gradually until the ladybugs are in prime condition for the fight. The Yakima colony is part of a much larger collection that will be used for the same purpose elsewhere.

Editorial Notes.

The Washington Legislature did a good job when it defeated the Gellatly cull-apple bill. It means a higher price for quality fruit.

"Better apple boxes" is a good slogan. With fruit prices at their present and prospective figures the grower can't afford to have his fruit spoiled by poor box material.

It is quite evident that the Skookum packers' convention was a live one. Apart from the instructive talks on co-operation and advertising the meeting resulted in constructive action that ought to help the grower greatly.

According to all reports apple blossoms in the Northwest appeared in most districts promptly on schedule. In fact in some sections they were unusually early. Now if Jack Frost will gracefully retire until next fall the fruit grower will be duly thankful.

Added interest will be given the article in this issue of BETTER FRUIT on "Summer vs. Winter Pruning," when it is stated that it is from the pen of a Hindu, M. Mitra, who is a student in horticulture at the Ohio State University. Mr. Mitra handles his pruning subject from a basis that will no doubt attract the widespread attention of his colleagues in horticulture.

With a greater number of high grade apple salesmen going abroad this year than ever before to investigate market conditions the export trade should be greatly stimulated. New markets will undoubtedly be opened up, a greater volume of business secured and a closer affiliation made with the big distributors in England and other foreign markets.

Notes of Activities in Strawberry Industry

WHILE the acreage in strawberries this year is very materially reduced as a whole in the United States, California is one of the few states to show an increase. It is estimated that the acreage in strawberries in California this year will be 4,000 acres as compared to 3,800 acres last year.

In Lewis County, Washington, 200 acres of strawberries will be marketed and in the Grays Harbor country 65 acres of blackberries will be shipped. The Vashon Island strawberry crop shows an increase of 20 per cent, heavier planting having been made in 1918.

In the State of Washington the production promises to be about the same as it was last year. The acreage now reported from there is 880 acres as against 850 acres in 1918. In 1917 there were 450 acres set out, while in 1916, before adverse conditions arose, there were 3,093 acres planted. Prices for berries in Washington are expected to rule very high this year, as a number

of contracts are stated to have been made at 16 cents by canners. Many of the growers, it is reported, are holding out for 19 cents.

At Kennewick the strawberry acreage in bearing this year in the hands of organized growers, is reported as 180 acres as compared to 225 acres last year. The organized growers expect to market their fruit this year for 15 cents a crate, making a saving of 5 cents over last year when the marketing price was 20 cents. The crates cost the growers from 8 to 9 cents.

One hundred carloads is the estimate put on the shipment of strawberries to be made from the Hood River district this year. Fine returns from berries for two years have caused an increase in the acreage at Hood River of 20 per cent. It is reported that the crop at Hood River has been sold in advance of the shipping season at a high figure. Canners are quoting prices in this section of 15 cents.

Doings of Fruitmen and Fruit Growers

At a meeting held recently J. A. Warman of the Peshastin Fruit Growers' Association was re-elected president of the Skookum Packers' Association. John L. Langdon of the Baker-Langdon Orchard Company was made vice-president, and P. R. Parks of the Spokane Fruit Growers' Company was elected secretary and treasurer.

A far-reaching amendment was recently adopted at the annual meeting of the Hood River Apple Growers' Association. It provides for the expulsion or fining of members who fail to abide by the rules of the association. A by-law was adopted in this connection to the effect that the offending member be tried before the directors.

The new members of the board of directors of the Hood River Apple Growers' Association elected recently are: P. S. Davidson, A. J. Graff, W. B. Dickerson, J. C. Porter, J. R. Nunnamaker, O. B. Nye, E. W. Birge, A. C. Staten, A. F. Bickford, Dr. J. D. Guttery and J. H. Jeffery.

Michael Horan, one of the best known fruitmen in the Northwest, and frequently called the apple king of Washington, died recently at Seattle of pneumonia. At the first National Apple Show held in Spokane in 1908 Mr.

Horan won the \$1,000 prize offered for the best carload of apples. For many years he was a successful horticulturist and at the time of his death owned a 60-acre orchard near Wenatchee. As a faithful attendant at all important fruit meetings Mr. Horan will be greatly missed by his fellow fruitmen.

The past season's yield of apples at Hood River reached 1,100,000 boxes and the crop was entirely sold before April 1. The estimate for this year's crop is placed at 1,500,000 boxes.

Prune growers at Roseburg, Oregon, believe that the blossom contracts for prunes made in California indicate what the Oregon price will be, and now expect that the price for 1919 will not be lowered much over that of 1918, when it was on a base of 10½ cents per pound. The Willamette Valley prune industry is reported to be in a thriving condition, although little planting was done this year owing to the shortage of nursery stock.

Dan Wuille & Co., the British apple exporters, who have been operating extensively in the Northwest for several years, have purchased the storage and warehouse plants of the Northwest Fruit Growers' Exchange at Hood River and announce that they will erect addi-

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QUALITY & PRICES**

**PERFECTION IN
FRUIT
LABELS**

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1423-24 NORTHWESTERN BANK BLDG.
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E. SHELLEY MORGAN
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WE CARRY - AND CAN SHIP IN 24
HOURS - STOCK LABELS FOR PEARS,
APPLES, CHERRIES & STRAWBERRIES.

**Nice Bright Western Pine
FRUIT BOXES
AND CRATES**
Good standard grades. Well made. Quick shipments.
Carloads or less. Get our prices.
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SPOKANE, WASH

KEEP BEES!

**HONEY IS THE BEST
SUBSTITUTE FOR SUGAR**
*and is more Wholesome
and Delicious.*

IF you own an orchard or keep bees, you should have a copy of our Catalog. It lists everything for the successful handling of bees and the production of honey.

We are pioneers in the bee supply business in the Northwest, are thoroughly familiar with local requirements and carry a large and complete stock.

Ask for Catalog No. 203
You can keep bees any place where they can forage within a mile.

**Western Agents
A. I. ROOT CO.** **Portland Seed Company**

KEEP BEES!

**HONEY IS THE BEST
SUBSTITUTE FOR SUGAR**
*and is more Wholesome
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IF you own an orchard or keep bees, you should have a copy of our Catalog. It lists everything for the successful handling of bees and the production of honey.

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Ask for Catalog No. 203
You can keep bees any place where they can forage within a mile.

**PORTLAND
SEED CO.**
PORTLAND, OREGON, TRADE MARK

tional warehouses and receiving stations along the line of the Mt. Hood Railroad this summer.

The announcement is made that the Richey & Gilbert Company will remove their headquarters from Toppenish to Yakima. The company will retain its warehouses at Toppenish and Selah.

H. F. Davidson, formerly president of the North Pacific Fruit Distributors, and now engaged extensively in the apple exporting business in New York, arrived at his home at Hood River recently. After a short trip over the apple-growing districts of the Northwest, Mr. Davidson will go to England during the summer to study conditions there and make new connections for the coming apple-shipping season.

In a recent inspection of the orchard conditions in the Grants Pass district A. C. Allen, member of the State Board of Horticulture, reported that he found conditions very favorable there. In speaking of the amount allowed the Board of Horticulture by the state, Mr. Allen said that it was only allowed the small sum of \$12,000 for two years, nearly half of which amount is necessary for fixed expenses. This, he stated, left but \$400 per year for each commissioner to take care of the expense in his whole district. In contrast to this small amount for the big and important fruit industry in Oregon, Mr. Allen called attention to the fact that about \$150,000 was appropriated by the legislature for the sport fisher and the fishing industry in the state. As an example of the value of the State Board of Horticulture to Oregon he told about it having accomplished one thing alone which was worth thousands of dollars to the state—the prevention of the tuber moth from gaining a lodgment here while California was overrun with this pest and the potato industry seriously crippled.

Owing to the "coming back" of the apple industry at Wenatchee a wonderful transformation has taken place there in the last two years in the way of lifting mortgages. Four years ago there were less than 1 per cent of the orchards at Wenatchee that had not been covered with a mortgage, while today 20 per cent are entirely free. The records also show that of those still encumbered, hundreds of second and third mortgages were lifted last year.

According to County Agricultural Agent Cate the blooming period for almonds, apricots, plums and peaches in the Medford district was a month later than usual this year, but apple blossoms were out about on schedule time, although considerably later than in 1916 and ten days later than last year.

"From the records kept of the blossoming dates of various fruit varieties for the past three years, we find that this season compares very favorably with the seasons of 1917 and 1918," said County Agricultural Agent Cate re-

cently. "The season of 1916 was a very early blossoming season, for many pear trees as well as apple trees were in full bloom during the month of March. The data on hand shows for the season of 1917 that the pear buds were separating in the cluster from the 10th to the 15th of April, and were in full bloom from April 15 to May 1.

"For the season of 1918, the records show that the fruit buds were separating in the cluster the first of April and that some pear orchards were in bloom by the first of April."

The value of farm vegetables in 1918 on the farms of the United States was \$1,246,000,000, or 7.6 per cent of all farm crops. Fruits were raised to the value of \$638,000,000, or about 4½ per cent of the farm crops' value.

The importance that has of late been directed to having bees in or near orchards is resulting in a wide movement among fruitmen to help the beeman and also in a campaign to start the keeping of more bees in all orchard districts. At Hood River a movement has been started to secure legislation for the protection of bees. While no laws can be secured in Oregon until the legislature convenes two years hence, orchardists are starting a campaign of education to assist in the passing of such laws when the time arrives.

J. S. Crutchfield, of the big fruit-handling firm of Crutchfield & Woolfolk, with headquarters at Pittsburg, made a tour of inspection of the Northwest apple-growing districts during the past month. Mr. Crutchfield in an in-



IMPROVE = PROTECT
YOUR FRUIT CROP

Arsenate of Lead

For thirteen years the GRASSELLI BRAND has been used throughout the fruit growing sections of the Northwest where it has given unvarying satisfaction to the user because of its all-round good qualities:

- IT kills the worms.
- IT sticks well to the foliage.
- IT is high in suspension qualities and will always be found dependable and uniform.

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Grasselli Arsenate of Lead Powder
Grasselli Arsenate of Lead Paste

The Grasselli Chemical Co.

Established 1839

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BOSTON

ST. PAUL
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DETROIT
MILWAUKEE
ST. LOUIS

PITTSBURGH
NEW ORLEANS
BIRMINGHAM

terview while here stated that the big thing confronting the nation for the next few years is food production, and that a large production of apples would be a big factor in helping the world to feed itself. He believes, however, that the heavy income and excess profits taxes are having a tendency to reduce the production of foods of all kinds and that they should be reduced. "We need," said Mr. Crutchfield, "all the fruit, all the grain and all the meat that it is possible to produce."

Under the direction of P. P. Peterson, head of the Soil Department of the University of Idaho, and H. H. Beler, County agricultural agent, an extensive soil survey of the soil of Kootenai County will soon be started. The work will be commenced June 1, and when completed and mapped will be of great value to the fruit grower and farmer in determining what kind of crops to plant in the various kinds of soil in the county.

According to Senator Lachmund, head of the green-fruit department of the Pheasant Northwest Products Company, hay or grain crops as an income producer will have nothing on the berry crop this year. In order to convince berrymen that he knows what he is talking about, Senator Lachmund comes forward with a statement that berry growers should make from \$500 to \$600 per acre on their berries for the next four or five years at the prices which his company is now offering. The company is ready to contract for 1,000 acres each of strawberries, raspberries and loganberries for the next five years, at prices which should make an earning per acre of the amounts already stated.

The proportion to which the Western New York apple movement assumed during the past season may be gleaned from the fact that up to March 1, 21,026 cars of fruit had been shipped from that section.

Strawberry Growers Attention!

We will take contracts for entire output of Strawberry Patches. Write or phone before contracting for the season.

Henry Weinhard Plant
Manufacturers of Weinhard Quality Beverages
PORTLAND, OREGON

"My WADE Saws Four Cords an Hour!"



"The Wade is certainly the farmer's friend. I have cut 1600 cords of yellow fir wood with it, and it's as good as the day I bought it."—Dan Ross, Corbett, Oregon.

Why break your back sawing wood by hand, when the powerful little Wade Portable Gasoline Drag Saw will outsaw 10 men at one-tenth the cost! Light, simple, economical. Cuts wood of any size. Averages 8 cords to a gallon of gasoline. Thousands of Wades now in use. When not sawing wood, the 4 h. p. engine will operate other light machinery.

Wade Portable Gasoline Drag Saw

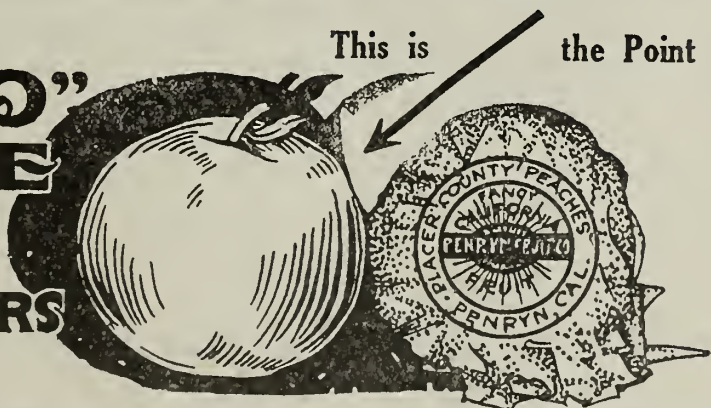
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Write today

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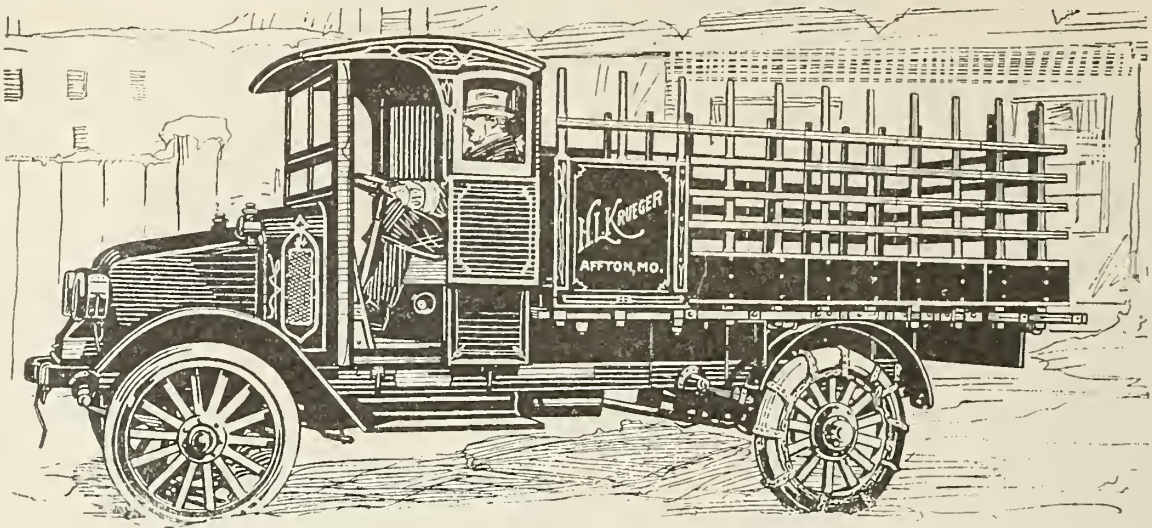
"Caro" from DessiCARE (to dry up)

**"Caro"
Prolongs the
Life of Fruit
Why?**

Fruit decomposition starts from a bruise which opens tiny holes and permits the juice to escape and BACTERIA to enter. "Caro" clings closely and dries up the escaping juice. "Caro" ingredients harden the spot, kill the BACTERIA, arrests the decomposition—and thus **PROLONGS THE LIFE OF FRUIT.** If your fruit is worth shipping it is worth keeping in best condition.

Demand "CARO"—Wrap Your Fruit in "CARO"—The Fruit Buyer Knows "CARO"

Order from Any Fruit Company or American Sales Agencies Co., 112 Market St., San Francisco



Ask an Owner

A MOTOR TRUCK represents an investment in hauling equipment. The truck that does the work year in and year out at the lowest cost proves to be the best investment. Ask any owner of an International Motor Truck and he will tell you the International cuts the cost of hauling down to the lowest practical point.

International first cost is low because of quantity production. Quality is maintained at a high standard because every important part of the truck is manufactured and each truck assembled in one great factory under centralized supervision. Every lot of material of every kind is subjected to the most rigid tests, and unless it passes those tests it is discarded. No inferior material or workmanship gets into

International MOTOR TRUCKS

These things are done because the International Harvester organization is building not alone for the present but for the future. We want every International Motor Truck owner to feel that he has the best truck he can buy and to be able to prove it at any time by any fair test that can be suggested or proposed.

Some day you will buy a motor truck. If you are the kind of a man that is not satisfied with anything but the most economical truck for hauling and delivery work, drop us a line, call up, or come in and see us. The more you know about motor trucks, the quicker we can convince you that the International is a mighty good truck to own. There is a style and size to meet almost every hauling requirement.

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San Francisco, California	Spokane, Washington		

Association News of Widespread Interest

At the recent annual meeting of the trustees of the Fruit Growers' Agency held at Spokane, Dr. H. L. Geary of Underwood, Washington, was elected president. The other officers chosen for the ensuing year were: Frank Reeves of Wenatchee, vice-president; D. L. Ingard of Payette, Idaho, secretary, and C. J. Webb of Spokane, treasurer. Action taken at the meeting will result in having the offices of the agency located in Spokane permanently. L. F. Sainsbury of Yakima retired as manager of the agency, stating that other duties would prevent him from serving this year. The matter that was given the greater part of its attention by the meeting was the 25 per cent

rate increase in freight rates on fruit which becomes operative May 25. A committee consisting of President Geary, C. W. McCullagh of Hood River, Robert C. Paulus of Salem, and Frank Reeves of Wenatchee, was appointed to prepare the data to be used in presenting the case of Northwest fruit shippers before the Interstate Commerce Commission in case the application for a formal hearing on the new rates is allowed. The by-laws of the organization were also amended so as to allow representatives on the board of trustees from the Rogue River and Willamette

Valleys in Oregon and the Lewiston and Clarkston district in Washington.

According to W. H. Gwinn, the well-known fruitman of Seattle, membership in the Fruit Growers' Agency is not to be limited to the large fruit-handling concerns if the sentiment of the members is adopted as the policy of the organization. "We need," said Mr. Gwinn, "the backing of every fruit grower in the Northwest, and I believe if we would put on a thoroughly organized campaign for membership there is no reason why we should not have an organization that would reach the 500 mark. There are many important questions before the agency now, but

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Use
Arsenate
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When

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Magnesium Arsenate

*The Modern
Agricultural
Poison*

Spreads more evenly, sticks better, costs less and is as safe or safer to use on tender foliage?

Use it this year in at least an experimental way and we are confident that you will use no other arsenical poison in the future. Others are buying tons of it.

For prices and particulars address

**THE
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MIDLAND, MICHIGAN

MYERS SPRAY PUMPS



Bucket, Barrel and Power Spray Pumps, Atomizers, Compressed Air Sprayers, Spray Guns, Nozzles and Accessories make up the extensive and successful line of modern spraying machinery manufactured by F. E. MYERS & BRO. Included are many styles and sizes for spraying, disinfecting or painting—they meet the needs of everyone who sprays, from the home gardener to the largest grower of fruits and vegetables, and every MYERS PUMP is guaranteed. Interesting Catalog on request. Ask your dealer or write us for it.

MYERS PNEUMATIC SPRAYER — Has Self-Locking D-Handle, Screw Top, Galvanized Iron Tank, Brass Cylinder and Adjustable Long Distance Nozzle. Spray can be adjusted from broad fan like to long distance.



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ORANGE ST.
F.E. MYERS & BRO. ASHLAND, OHIO.
FARM OPERATING EQUIPMENT

Mitchell
LEWIS & STAYER CO.

Northwest Distributors
PORTLAND, OREGON

Diamond CHICK FOOD



SAVES LITTLE CHICKS and helps them to grow into big, strong, healthy birds.
A clean, wholesome, natural food—no dust—no waste. Keeps the chicks healthy and makes them grow fast.

Look for our Name and Trade Mark on Every Original Package

OUR 1919 CATALOGUE

Of "Diamond Quality" Poultry Supplies, listing everything necessary for the profitable production of poultry mailed free on request. Ask for Catalog No. 202

Day
Old
Chicks

**PORTLAND
SEED CO.**
PORTLAND, OREGON

Thoroughbred
Poultry
and Eggs

"BUCKEYE" Incubators and COLONY Brooder Stoves

the paramount one is the proposed increased freight rate and we should have the support of every man who is connected with the fruit industry in fighting this increase."

The announcement is made by Ira L. Hyde, manager of the White Salmon Fruit Growers' Association, that it will cease operations at the end of the 1919 strawberry season. The stock, merchandise and other property of the association has been sold to E. A. Mansfield, who has been connected for several years with the organization. In future, fruit from the White Salmon district will be largely shipped through independent agencies.

By recently declaring a total dividend of \$40,000 on its capital stock of \$25,000 the Salem (Oregon) Fruit Union made one of the most remarkable showings in the history of the Northwest fruit industry. Of this amount an 8 per cent cash and a 100 per cent stock dividend was voted by the directors of the Union, which also increased its capital stock to \$100,000.

The rapid and strong growth of the Hood River Apple Growers' Association was called attention to recently when the organization purchased the cold storage plant of the Hood River Apple & Storage Co., giving the association control of all the cold storage in the Hood River Valley, except that owned by the Davidson Fruit Co. In speaking of the success of the association Manager Stone said: "On April 16, 1914, the date on which our organization had its birth as a co-operative concern, we had no funds and our chief assets were the co-operative spirit and a determination to serve the interests of Hood River Valley fruit growers. The Apple Growers' Association will celebrate its birthday tomorrow by announcing the purchase today of the Van Horn storage plant of the Hood River Apple & Storage Co." The total storage capacity of the Hood River Association now reaches 450,000 boxes.



Beat it
with a
**FISH BRAND
REFLEX
SLICKER**

Keeps out all the wet

DEALERS EVERYWHERE

Waterproofs,
Absolute,
are Marked thus —



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Save Your Orchard

It takes years to grow a fine orchard. A colony of insects can destroy it in one season. Tree Tanglefoot will effectually protect fruit and shade trees from most of our destructive insect pests, i. e.:

Canker worms
Brown-tail moths

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Ants

One application stays sticky three months and longer, outlasting ten to twenty times any other substance. Easily applied with wooden paddle. One pound makes about ten lineal feet of band. It will not soften, run or melt, yet is always elastic, expanding with growth of tree. Effective rain or shine. Needs no mixing, used exactly as bought.

Endorsed by prominent Horticulturists.

For Tree Surgery

Superior to anything on the market. It is the best application after pruning or trimming. It will waterproof crotch or cavity or wound when nothing else will.

Sold generally by Seedsmen.

Price: 1 lb. cans, 50c; 3 lb. cans, \$1.45; 10 lb. cans, \$4.50; 20 lb. cans, \$8.75; 25 lb. wooden pails, \$10.50.

Write for free illustrated booklet on leaf-eating insects.

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Manufacturers of Tanglefoot Fly
Paper and Tree Tanglefoot

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(121)



Richey & Gilbert Co.

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Growers and Shippers of

Yakima Valley Fruits and Produce

SPECIALTIES:

Apples, Peaches, Pears and Cantaloupes

TOPPENISH, WASHINGTON

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BELL & CO.

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A pure white corn product that will not stain the most delicate label. Thousands of canners and labelers swear by Rex Paste.

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Reasonable in price.

Unsurpassed for quality.

Write us for free sample and prices.

Patent Cereals Co.

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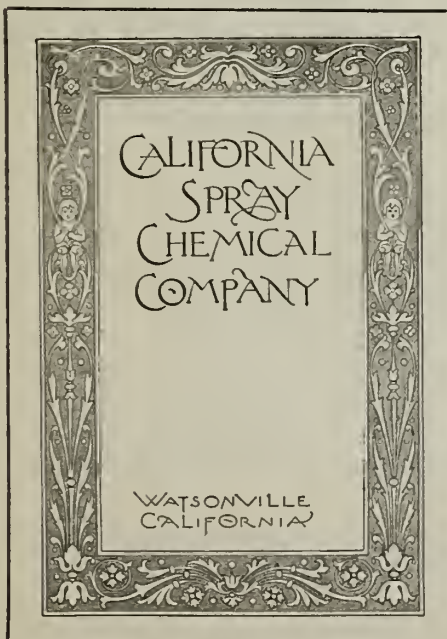
Plant Pathologists Meet

The annual meeting of the Pacific Division of the American Phytopathological Society, which was held in Portland April 25 and 26, resulted in the presentation of many valuable papers on plant diseases, followed by interesting discussions on the various subjects. The sessions of the society were attended by plant pathologists from all sections of the Pacific Coast and Western Canada. Dr. F. D. Heald, Professor of Plant Pathology at Washington State College, president of the organization, presided at the meetings and Professor W. T. Horne, Associate Professor of Plant Pathology of the University of California at Berkeley, was present in his capacity of secretary.

Although this was only the second meeting of the Pacific division, which was organized last year, the attendance was large and interest in its deliberations was sustained throughout the two days' work. The program, which covered a wide list of subjects, was ably presented by the various members in attendance and the discussions brought out many new points for the pathologists to consider in fighting plant diseases of fruit trees, truck crops and cereals. Already the organization of the Pacific division of pathologists has resulted in a closer affiliation and greater organized effort in stamping out plant diseases, and is expected to accomplish much more in the future.

In electing officers for the society for the ensuing year, Dr. F. D. Heald, Professor of Plant Pathology at Washington State College, was re-elected president; Dr. E. P. Meinecke, Forest Pathologist in charge of the Pacific Coast Division of San Francisco, was elected vice-president, and Professor W. T. Horne, Associate Professor of Plant Pathology at the University of California at Berkeley, was re-elected secretary.

Others who were present were: W. A. McCubbin, St. Catharines, Ontario, Canada; M. L. Dean, Olympia, Washington; M. B. McKay, Corvallis, Oregon;



Top Dressing Talks

FIRST the blossom, then the fruit—but the experienced grower knows that he must help nature with plant food, or the fruit will not mature. Apply 100 to 150 pounds per acre of

Arcadian Sulphate of Ammonia

just before blossoming time. It is the most efficient nitrogenous top dressing for orchard, field or garden.

ARCADIAN Sulphate of Ammonia is the well-known standard article that has done you good service in your mixed fertilizers for years past. Especially kiln-dried and ground to make it fine and dry. Ammonia 25 $\frac{1}{4}$ %. Made in U.S.A.

The Great American Ammoniate

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For Information as to application, write **The Barrett Company** New York, N.Y.
Medina, Ohio
AGRICULTURAL DEPARTMENT



Seasoned Lumber

Boxes made from SEASONED lumber insure your fruit pack against mildew which causes thousands of dollars' loss every year where containers made of green material are used

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Carefully inspected and expertly sawed.
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Tractor Popular at Hood River

Cleveland tractors, which were seen at work at the Walla Walla tractor demonstration recently, are winning considerable notice and many friends in the Hood River orchard district. W. L. Nichols, County Roadmaster at Hood River, tells a story of how a Cleveland tractor won him enough cigars recently to last a year.

"The county crew," Mr. Nichols said, "was having trouble in getting a new electric motor, weighing a ton, to the top of some gravel bunkers at a point west of the city. Finally I got 300 feet of steel cable, rigged a block on top of the bunkers, and put the motor on a sled built on a track used by gravel cars. Then I hooked on to the end of the cable with a new Cleveland tractor the county had just bought.

"By that time a big crowd had gathered. Then men wanted to bet that I couldn't move the motor with my little tractor. I had to back my judgment, so every time somebody bet a box of cigars I covered him. Well, sir, I felt a little shaky when I thought of having to pay all those bets myself, but I was safe enough. When I opened the throttle that little Cleveland just walked away and the motor slid up without a slip."

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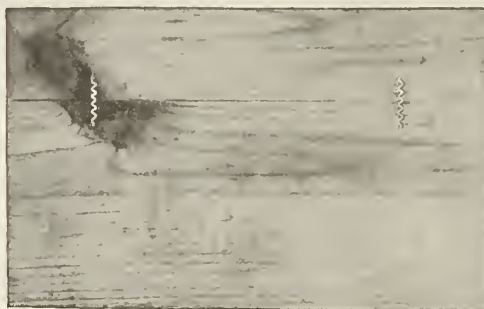
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Make Strong 2-Piece End Boxes.

Acme Patented Divergent Saw Edge Fasteners will not pull out and holds better than cleats or glue.



Write nearest office for samples and prices.

ACME Strapping protects goods from damage and pilferage.

ACME STEEL BOX STRAPPING



Specify ACME CORRUGATED JOINT FASTENERS.

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Works: 2840 Archer Avenue, CHICAGO

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Farmers, Fruit Growers and Home Owners ATTENTION!

Write for our big descriptive catalogue and prices for trees delivered to your nearest railway station, freight paid.

PEARS PAY. Chester Ferguson, of Yakima, Washington, realized an average of \$2,016 per acre for pears this year, 1918. **PLANT PEARS.**

Agents wanted to represent us in each locality. Address

OREGON NURSERY COMPANY

ORENCO, OREGON

You bet'cha!



"The more a man knows about genuine tobacco, the surer he is to see the value of Real Gravely in comparison with ordinary plug."

Good taste, smaller chew, longer life is what makes Genuine Gravely cost less to chew than ordinary plug.

Write to:—

GENUINE GRAVELY
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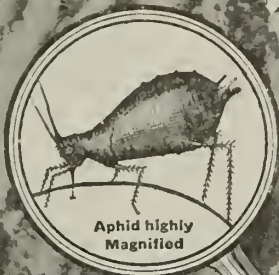
for booklet on chewing plug.

Peyton Brand
REAL CHEWING PLUG
Plug packed in pouch

Kill Aphis

*Before Aphis
Kills Your Profits*

This tiny, sap-sucking insect, scarcely larger than a pin-head, is destroying apple profits all over the country. Feeding with its sharp, mosquito-like bill, it causes dwarfed, deformed, unmarketable fruit. Curls foliage. Weakens trees. Spray with



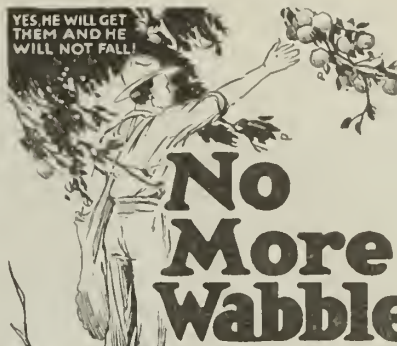
Black Leaf 40

40% NICOTINE

and control Aphis, Red Bug, Leaf Hopper and other soft-bodied, sucking insects. Aphis is making its appearance in many sections for the first time. Regarded by many growers as the most destructive apple insect. One aphid produces thousands in a few weeks. Spray with Black Leaf 40 and save your profits. Can be used with lime-sulphur, arsenate of lead, bordeaux and other sprays as recommended, or may be used separately, if desired. Mixes perfectly with water. Costs only about 1c per gallon diluted for the trees. Recommended by agricultural colleges and experiment stations. Send for **Free Spray Chart and Leaflets** showing when and how to spray and how to protect fruit trees, vines and vegetables from these profit-killing insect pests.

The Kentucky Tobacco Product Co.

Incorporated
Louisville, Kentucky



—no more getting down to change the position of your ladder every half-minute! Get the

SECURITY LADDER

"A Ladder with the Wobble left out"

Bound and supported at every step by a patented steel cuff-bracket. Cuts your picking costs. Saves pickers time by enabling him to reach out farther and feel a greater sense of security, means a better day's work; reduces picking costs!

SECURITY cuff brackets are made of two ounces of sheet steel, attached to each step-end and machine wrapped around stile (side-rail) by a patented process. Makes SECURITY ladders strongest where others are weakest; does away with cutting into and weakening stile to fasten steps in. SECURITY steps easily replaceable without weakening ladder. All wood vertical grain.

Most all big Sunkist orange growers use SECURITY, used in many orchards of Sacramento and San Joaquin; recognized standard ladder in big apple districts of the Northwest! SECURITY is the ladder YOU need NOW!

For sale by SECURITY dealers only. Write me; I will send you name of your dealer and new booklet on the SECURITY ladder. Write NOW!

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For style and comfort
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HONORBILT SHOES

For all
the Family
Ask your dealer for Mayer
Shoes. Look for the trade-
mark on the sole.

F. Mayer Boot & Shoe Co.
Milwaukee, Wis.

Future Prospects for Markets for Our Apples Abroad

Continued from page 10.

embargo upon foreign shipments and thousands upon thousands of people have become accustomed to buying and consuming high grade box apples. The demand that other parts of the world will make upon American industry will keep the mining and factory centers busy.

Young Americans are already leaving this country to study trade conditions in distant parts of the world. Americans have become accustomed to travel and have received, many of them, an education in world politics and world business. With co-operation at home and with the "good-will" asset that all Americans now have, these representatives of American industry will attain success.

Credit systems are being perfected and extended. American-built and American-owned and American-manned ships are again upon the high seas.

This matter of shipping is of more importance than most Americans imagine. Until, for example, a low tariff upon meats enabled Argentina to ship fresh meat to this country, there was no line of ships with refrigerated space operating between the United States and South America. In 1907 or 1908, when the Van Dyke and her sister ships were put into the meat trade, apple shippers for the first time had opportunity to send box apples in refrigeration to South America direct. Theretofore it had been necessary to ship apples to England and from England to South America.

The Shipping Board has built twelve to twenty refrigerated ships, which are now engaged in transportation particularly of meats on the Atlantic. These in time should be available for new ventures in the fruit-shipping business.

Lime-Sulphur Summer Spray for Apple Scab

Continued from page 9.

removed, and the trees opened up so as to insure a good circulation of air through the branches.

In conclusion, I would say that lime-sulphur, applied summer strength, (1) when the blossom buds show pink, (2) when the petals fall, and (3) three weeks after the petals fall is an effective remedy for the control of apple scab under our conditions in Northern Idaho. Furthermore, these factors must be kept in mind if the growers are to obtain similar results in the control of this disease:

(1) Timeliness, which necessitates making the applications at the times specified above.

(2) Thoroughness, that of covering the trees and fruits uniformly with the lime-sulphur solution.

"Better apple boxes" is a good slogan. With fruit prices at their present and prospective figures the grower can't afford to have his fruit spoiled by bad box material.

Pacific Coast Agents
**United States Steel
Products Co.**

San Francisco
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J.C. Pearson Co., Inc.
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PEARSON
ECONOMY in buying is getting the best value for the money. not always in getting the lowest prices. PEARSON prices are right.
ADHESIVENESS or holding power is the reason for PEARSON nails. For twenty years they have been making boxes strong. Now, more than ever.
RELIABILITY behind the goods is added value. You can rely on our record of fulfillment of every contract and fair adjustment of every claim.
SATISFACTION is assured by our long experience in making nails to suit our customers' needs. We know what you want; we guarantee satisfaction.
ORIGINALITY plus experience always excels imitation. Imitation's highest hope is, to sometime (not now) equal Pearson—meantime *you* play safe.
NAILS



WHAT EVERY HOME CANNER SHOULD HAVE

ONE of our **H. & A. Hand Power Double Seamers.** It is the only hand power seamer built that will seal all sizes of sanitary fruit and vegetable cans. Write for prices and descriptive matter to Department T.

HENNINGER & AYES MFG. CO., Portland, Ore.
Builders of Seamers and Steam Pressure Canning Outfits

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CATALOGS STATIONERY
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WRITE FOR PRICES AND SPECIFICATIONS • OUT OF TOWN ORDERS EXECUTED
PROMPTLY, ACCURATELY AND ECONOMICALLY
WE PRINT BETTER FRUIT

F.W. BALTES & COMPANY
PORTLAND, OREGON

Fruit must be handled quickly—

Prompt shipment and a minimum of handling are necessary to deliver fruit in the best condition. A Mathews Gravity Roller Conveyor will save not only time and handling but it will save labor as well.

MATHEWS
SPEED ECONOMY
GRAVITY ROLLER CONVEYER



The sections of steel ball bearing rollers can be set up in portable units or permanent systems. Just a man or two at each end for loading and unloading—gravity supplies the power. Boxes and crates glide quickly and smoothly over the rollers, straight ahead, around corners, to any point you wish.

Curves, switches and other special devices make the Mathews System adaptable to practically every need. Upkeep is negligible because of the unusually sturdy construction.

In almost every line of business Mathews Conveyers are paying for themselves in labor and time saved. Find how they can help you. Write for our illustrated literature which gives full details.

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Dehydration Develops Agriculture

To support dehydration every grower of vegetables and fruit in Oregon and Washington should be vitally interested in growing vegetables as a business and not as a side line

Dehydration removes an average of nine-tenths of the water contained in vegetables and fruits, and thereby eliminates the great barrier existing against long-distance vegetable shipments. Oregon and Washington's climate is ideal for growing vegetables of the highest quality and now, with this big freight obstacle overcome, we are ready to introduce Oregon and Washington quality vegetables to the markets of the world.

You, Mr. Farmer

having a clear vision of the future, must know that Western Oregon and Washington have a wonderful industry before them in fruit and vegetable growing. Are you considering the opportunities open for you, and if so why not commence now to support the establishment of this great new industry? Our first requirement is that you

Grow More Vegetables

We need, and are prepared to make contracts now for:

String Beans

Burpee's Stringless Green Pod variety, an early maturing bush bean. Thousands of acres in the Willamette Valley and elsewhere will grow fine string beans, many of which have been overcropped with grain. Such soils need a legume crop like beans. The culture of beans is fully covered by our Free Bulletin on Bean Growing.

We also wish to contract for Rutabagas, Potatoes, Celery, Onions, Peas and Loganberries. Get in touch with us at once. Address

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FACTORIES AT THE DALLES, OREGON; SALEM, OREGON

Squash

Boston Marrow variety. Squash are the easiest of all vegetable crops to grow. They need a warm, rich soil. Nearly all of the cultivation can be done with a team, thus eliminating much of the labor cost. Ten to twenty-five tons per acre can be grown on adapted soils. Write for our Free Bulletin on Squash Culture.

Cabbage

Danish Ball Head or Danish Round Head varieties — a profitable crop to grow and one which can be planted late, thus relieving the stress of spring work. Write for our Free Bulletin on Cabbage Culture.



Discusses Winter Pruning vs. Summer Pruning

Continued from page 8.

sugar) on the upper part of the tree, and it seems in applying this knowledge in pruning we will be inclined to prune our dormant trees as best we can, so as to save the bearing trees from excessive loss of carbohydrate food materials. The best time for pruning, therefore, as reason appeals, is from the latter part of December to the middle of March in heavy winter condition, while this will certainly vary under different climatic conditions.

It would not be out of place here to say that heavy pruning of bearing trees, except in cases of old trees, is always inadvisable. This not only dwarfs the trees, but makes them lose the food material stored partly in large limbs and thus makes the trees lose the vitality of growth and fruit bearing. Besides pruning in summer time is not always necessary. It depends on the nature of trees. But in no case is heavy pruning advisable in summer, while in a crowded tree slight topping off is beneficial both in admitting light and in bringing an optimum amount of fruit production.

After all, it may be said that the old saying "Winter pruning for wood growth and summer pruning for fruit bearing" might not be entirely true, but it seems to bring about an equilibrium of the two factors by maintaining a balance of the carbohydrate food materials and soil nutrients, we might as well recouse to winter pruning instead of summer pruning and thus save our trees to maintain growth and bear fruits to best advantage.

ROOSEVELT HIGHWAY WILL BENEFIT EASTERN OREGON IN MANY WAYS

Though it is a fact not generally known, Tillamook County, the most productive dairying section of the State of Oregon, has to ship in hay and other forage for its dairy herds. On this account farmers of Eastern Oregon profited to the extent of \$100,000 in 1918. While the Tillamook section and the coast country in general boasts as fertile soil as can be found anywhere, the grasses grown there are not converted into winter fodder, for the reason that the product is more valuable for grazing dairy cattle.

Tillamook County was not the only coast county that proved to be a good customer of the alfalfa raisers of the irrigated lands of Eastern Oregon. All the rest of the seven coast counties purchased hay as well, though in smaller quantities.

The proposed Roosevelt highway along the coast would open up a great agricultural empire in that region, and in a few years millions of dollars would flow out to the hay producers where now only hundreds of thousands are spent by the dairymen.

In 1918 Tillamook County sold throughout the United States \$2,000,000 worth of cheese and dairy products alone. This gives an inkling of what

will be the result if millions of acres of land like that in Tillamook are opened up to cultivation and settlement through the medium of the Roosevelt highway. Based on what has been shown in Tillamook County, \$100,000,000 worth of taxable property would be added to the wealth of the state if the rest of the coast region is developed in like manner.

Grass is green every day of the year on the ocean side of the coast range of mountains, and the climate is so mild that cattle do not need to be kept in barns and fed, as in other dairy sections of the United States, notably in the Middle West and on the Atlantic seaboard, but, as has been stated already, it has been found more profitable to keep the land sowed down to clover pasturage for the dairy herds

than to raise hay thereon. That is why the coast country will always be a great market for Eastern Oregon hay.—Adv.

High Prices for Pears.

Prices received for pears the past season have just been given out by the Hood River Apple Growers' Association, which show that the Bosc variety headed the list, half boxes bringing \$1.95, with \$3.65 for the fancy and \$2.75 for the C grade of full boxes. Other varieties brought the following figures: Bartlett's, fancy \$2.07, C grade \$1.82; Beurre d'Easter, fancy \$1.83, C grade \$1.58; Comice, fancy \$2.45, C grade \$2.20; Flemish Beauty, fancy \$2.20; C grade \$1.95; Winter Nelis, fancy \$2.01, C grade \$1.76; D'Anjou, fancy \$2.88, C grade \$2.38.



A Social Help

Let's suppose it's a church or school social—or a Red Cross rally—or a "get-together" meeting of the Farm Bureau—or what not—

Will Ghirardelli's be there? What a question! For this delicious, appealing food-beverage is *always* in order at any social function. It means cheer and comfort and warmth! It provides a social help that no hostess (whether she has in mind a "big affair" or a "little party") can afford to overlook.

In ½ lb., 1 lb. and 3 lb. cans—at the store where you do your trading.

Say "Gear-ar-delly"

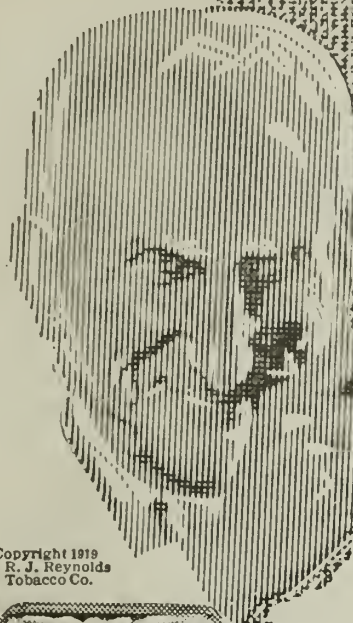
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Ghirardelli's Ground Chocolate





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puts over a turn
new to every man fond

of a tobacco smoke—whether
it's through a jimmy pipe or
via a home made cigarette!
P. A. is such a revelation it
wins your friendship completely,
giving you a brand of satisfac-
tion and keen enjoyment that never
before has been yours.

Tell you the truth, Prince Albert
will make such a hit with your taste
and your tongue, you'll wish you had
been born twins so you could smoke
just about twice as much! And, all this delight P. A.
hands out can be credited to its quality.

And, right behind this quality flavor and quality fra-
grance is Prince Albert's freedom from bite and parch
which is cut out by our exclusive patented process.
We tell you to smoke your fill at any clip—jimmy pipe
or makin's cigarette—without a comeback! Does that
sound like the goods to you?

*Buy Prince Albert everywhere tobacco is sold. Toppo red bags,
tidy red tins, handsome pound and half pound tin humidors—and
—that clever, practical pound crystal glass humidor with sponge
moistener top that keeps the tobacco in such perfect condition.*

R. J. Reynolds Tobacco Company, Winston-Salem, N. C.

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For European



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Cooking and Canning Is a Real Pleasure

Note the picture. You cook everything at
once, over one fire. Everything cooked per-
fectly under steam pressure—no burning, no
mixing of flavors, no shrinkage of the food.
With it you can everything by the cold pack
method—fruit, vegetables, meats, etc. Thou-
sands are using Conservo and say it's worth
its weight in gold.

Conservo Cooker



No. 20, Conservo.
21½ in. high, 11¼
in. square; 4 re-
movable shelves;
two pans, cooks for
3 to 15 persons;
holds 14 1-qt. jars
for canning. No.
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in. high; 2 shelves;
one pan; cooks for
two or three per-
sons, holds 8 1-qt.
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Works
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"Conservo" is a time and money saver.
It is a blessing to the housekeeper. Every
home should have one. It will pay for
itself in a few months' time by the saving
in food and fuel. Foods cooked in it are
delicious—they retain all their flavor and
natural juices. Canning is done perfectly
and with least possible effort.

Write today for booklet and information.

OUTWEST SUPPLY CO.

PORTLAND, OR.

Liming the Soil

**Its Effect Upon Fruit Trees
and Their Fruit**

- LIME** neutralizes the soil, making an acid soil sweet.
- LIME** makes the soil porous and mellow and easy of cultivation.
- LIME** unlocks plant foods which an acid soil causes to be locked.
- LIME** forms, with other elements of the soil, that strong bright leaf foliage growth.
- LIME** on the soil prevents scab on the skin of the fruit, or the leaf of the plant.
- LIME** prevents gummosa in the cherry, peach and plum trees.
- LIME** makes the fine plastic bark on all fruit trees, thus increasing their growth.
- LIME** makes the best of quality in flavor and fragrance in all fruits.

Do not use any form of burned lime.

LIMO

is pure ground limestone—Unburned—made from a soft porous stone, readily absorbed by the soil.

"No other rock like it."

NOW is the time to apply it.

MANUFACTURED BY

Tacoma Lime Products & Fertilizer Co.

Write us for information.

Tacoma, Wash.

Prospects for Northwest Peach Crop Good

THE government report on the prospects for the peach crop of the Pacific Northwest at this time are very encouraging and most of the states in this section expect to have a much larger crop than last year. The report says:

California

Reports generally from California indicate almost a 100 per cent condition for peaches. Rainfall was sufficient during the winter to leave the soil in splendid condition and to start the trees out with strong, healthy fruit buds. Bloom was very heavy and climatic conditions were very favorable for a heavy set of fruit. The season is about a week late in most sections. Fresno, the leading peach county, is reported

with very favorable prospects. It is not impossible that the 1919 peach production of California will equal the 1917 crop and exceed last year's crop by 25 per cent.

Colorado

Prospects on the Western Slope of Colorado are for about the same size peach crop as was harvested last year. Conditions for the state are given at 72 per cent of a full crop. While prospects are thus far excellent for a good crop at Palisades in Mesa County, reports indicate that the 1919 production from this section will fall 10 or 15 per cent below last year's 900-car crop. Delta County shows prospects for a very much better crop than was harvested last year, possibly sufficient to

more than make up any deficiency in the Palisades shipments. The critical season has not been passed.

Washington

Washington State had a very light crop in 1918, but promises a very good crop this year. The Yakima Valley, which is the principal producing region, may ship over 2,000 cars as compared with about one-third this amount in 1918. Wenatchee Valley, though considerably less important, is reported with splendid prospects.

Utah

Attention is centered at Provo in Utah County and at Brigham City in Boxelder County. Both districts, as well as Weber County, have excellent prospects for a peach crop this year. Provo may ship as many peaches as last year, or between 400 and 500 cars. Frost danger in Utah is not over until May 15.

Idaho

The Emmett district in Gem County and the Council district in Adams County, which are the leading peach sections in Idaho, have thus far escaped frost injury, and have excellent prospects. Idaho may ship 350 cars this year as compared with almost a failure in 1918.

Oregon

Oregon, although relatively unimportant commercially, has excellent prospects in the Milton-Freewater section, in Marion County, and in the Rogue River Valley. Very few cars will be shipped out of the state.

Get Your Irrigated Farm From the Canadian Pacific

IN a climate not excelled by any agricultural area in America you can own a fine, rich farm of your own. The Canadian Pacific Railway offers you this opportunity to achieve independence and grow rich—in Western Canada. The lands offered are in the largest and most substantial irrigation undertaking in the Continent. The price is only \$50 an acre—some for less.

Twenty Years to Pay

You pay down 10% and have 20 years in which to pay the remainder. The first crop is often worth more than the total cost of the lands.

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STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912.

of the Better Fruit, published monthly at Portland, Oregon, for April 1st, 1919.

State of Oregon, County of Multnomah—Before me, a notary public in and for the state and county aforesaid, personally appeared D. L. Carpenter, who, having been duly sworn according to law, deposes and says that he is the business manager of Better Fruit, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the act of August 24, 1912, embodied in section 443, postal laws and regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor and business managers are:

Publisher, Better Fruit Publishing Co., Inc., 800 Oregonian Building, Portland, Oregon.

Editor, E. E. Faville, 800 Oregonian Building, Portland, Oregon.

Managing editor, none.
Business manager, D. L. Carpenter, 800 Oregonian Building, Portland, Oregon.

2. That the owners are: (Give names and addresses of individual owners, or, if a corporation, give its name and the names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock.)

Owner, Better Fruit Publishing Co., Inc., Portland, Oregon.

Stockholders, D. L. Carpenter, 800 Oregonian Building, Portland, Oregon.

E. E. Faville, 800 Oregonian Building, Portland, Oregon.

A. W. Stynes, 800 Oregonian Building, Portland, Oregon.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner, and this affiant has no reason to believe that any other person, association or corporation has any interest, direct or indirect, in the said stock, bonds or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is: (The information is required from daily publications only.)

D. L. CARPENTER,

Business Manager.

Sworn to and subscribed before me this 1st day of April, 1919.

(Seal.) H. R. SHAW,

Notary Public for Oregon.

(My commission expires September 21, 1921.)



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Possible Cause of "Sour Sap"

Continued from page 6.

the active temperature in the orchards are available. Experiment Station records, however, show that the lowest temperatures for April at Corvallis occurred when the trees were in full bloom, and were as follows: April 2, 27°; April 3, 24°, and April 4, 26°. At Hermiston and Stanfield in Eastern Oregon, while the temperature fell to 25°, 17° and 18°, respectively, on April 1, 2 and 3, and during the weeks ending April 20 and 27 the minimum temperatures were 26° and 25°, respectively, and the crop was ruined, no appreciable injury was done to the trees. Likewise in the vicinity of Medford the temperature fell to 21° in certain orchards, and while the crop was more or less reduced no apparent injury was done to trees, either young or old. It is my belief that temperature in the orchard sections of the humid Northwest rarely, if ever, falls low enough in April or May to cause serious injury to the trees, although it may rarely cause the loss or partial loss of the crop.

What, then, is the cause of "spring injury"? I do not know, but during recent months I have developed a theory which I believe accounts for it and offers hope of very largely preventing it. In brief it is this:

Spring injury is due to acute nitrogen starvation during the most active vegetative periods in the life of the tree.

The first objection to this theory no doubt will be that the most serious spring injury often occurs in orchards which have shown none of the characteristics of nitrogen starvation, and that the most vigorous trees are often most seriously injured; the second will be that it often occurs in orchards growing upon soils which are known to contain a fair amount of nitrogen—or at least are not known to be markedly deficient in nitrogen.

The answer to the first objection is that if acute nitrogen starvation is the cause of spring injury we should expect that the most vigorous trees at their most active vegetative period would suffer most since their needs are greater. To the second objection the answer is that though nitrogen may be present in the soil in normal amounts it may not be available for the use of the tree during the critical period of its most active vegetative development.

Plants can obtain the necessary nitrogen only when it is in the soil in the form of nitrates. But nitrates are readily soluble; and at the time of spring injury—at the time the trees are most in need of an adequate supply of nitrates—the soils of the humid portions of the Pacific Northwest have been subjected to a drenching and leaching process for a period of approximately six months. Is it not possible—even probable—that the nitrates, even though they may have been present during the preceding summer and fall in normal amounts, have been so depleted that the trees may suffer from acute nitrogen starvation during a few brief but critical weeks? Soil analyses

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which have been made by our chemists indicate that this may be true.

Of course in the more friable, better drained and less acid soils the processes of nitrification doubtless serve to keep up a constant though often insufficient supply of nitrates, and it is significant that spring injury rarely, if ever, occurs to orchards on such soils.

But the processes of nitrification, or, at least the rate at which these processes operate, are determined by the more or less favorable conditions of heat, air and moisture which prevail in the soil. Thus it is that the most serious spring injury occurs upon cold, heavy, often acid and poorly drained soils where the processes of nitrification are not sufficiently active to maintain the available supply of nitrates.

In brief, then, the theory which I am presenting for your consideration is that "spring injury" is due to acute nitrogen starvation induced, first, by the leaching from the soil of the accumulated supply of nitrates, and, second, by conditions which inhibit the processes of nitrification and thus prevent the production of new supplies of nitrates at a time when they are most needed.

Should the theory prove to be tenable it explains, I think, not only the cause of "spring injury" or "sour sap" but may also explain the cause of "Cherry Tree Gummosis," which, so far as I am able to determine, differs from the spring injury of other trees only in the fact that the cherry tree has a tendency to gum more or less profusely when injured. It would also doubtless explain the cause of the rapid and very noticeable "yellowing" of thousands of acres of grain on poorly drained soils. It might also account at least in part for the slow early season growth of spring-planted crops upon our colder soils.

Should experiments and experience demonstrate that the theory is sound it would apparently follow that spring injury and related troubles can be largely, if not wholly, prevented by taking such measures as may be necessary to provide an available supply of nitrates to tide the trees over the critical period from a week or two before blossoming to two or three weeks after, or until the weather and soil conditions become favorable for the processes of nitrification. The quickest and most readily available method of supplying the necessary nitrates would be to make a light application of nitrate of soda to the soil, say ten days before the trees are to bloom. Early cultivation, where possible, the liming of acid soils, drainage, the growth of cover crops, and other practices which tend to favor nitrification will doubtless suggest themselves. If the natural processes of nitrification are to be depended upon to supply the necessary nitrates it is evident, I think, that the soil must be put in the best possible condition to promote these processes some time in advance of the blossoming period and must be kept in that condition until danger of injury is past. If for any reason the soil cannot be placed in the

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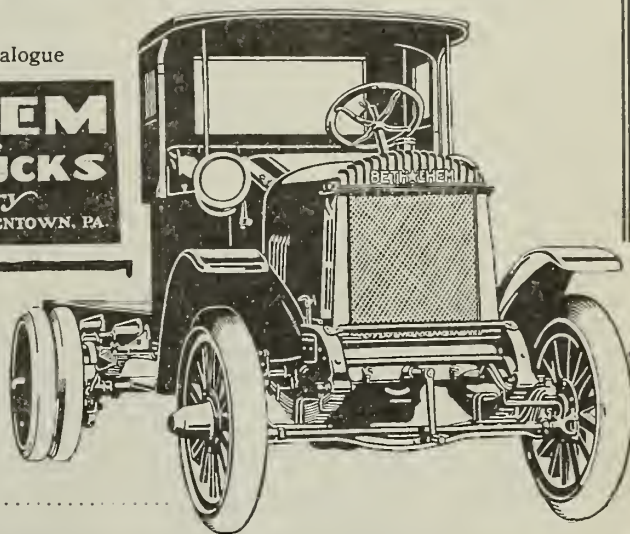
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loose, friable, warm condition which is necessary to promote nitrification I can see no other alternative than to resort to the light application of nitrate of soda.

More Fruit Acreage to be Planted in Hood River

AN increase of nearly 200 acres of orchard acreage will be made in the Hood River Valley this year, although no new tracts of large area will be planted. This is in striking contrast to the conditions in the Hood River Valley during the past four years, where there has been a decrease in acreage owing to the fact that tracts not adaptable to fruit are being grubbed out. It is stated that although growers desire to plant more heavily than the program now announced, that they could not do so on account of a shortage in nursery stock. The new orchard plantings at Hood River will be largely pears on account of the large profits made by pear growers during the past year. The promising outlook for apples, however, is also causing many growers to consider larger acreages and it is expected that next year, if labor conditions become normal, that there will be a heavy planting of apple trees. These plantings, it is said by orchard men at Hood River, will have to be made in the Upper Valley, as they estimate that there is less than 500 acres of land in the Lower Valley now left that is adapted to successful tree growing. Indications also point to a much heavier increase in the strawberry acreage in the Hood River district during the next year or two.

The acreage now available for the heaviest plantings in the near future will be made on a 2,000-acre logged-off tract south of Dee in the Upper Valley, which is being offered to growers in 10-acre tracts.

Government Activities

Among other things that the Bureau of Markets is taking up is the investigation of foreign markets for fresh and dried fruits in order to assist the fruit shipper in reconstructing the former substantial trade that the United States had with Europe, and also to develop export outlets in other directions. Bulletins relative to this work of the Bureau of Markets will be issued in the near future and will contain the results of fruit-market investigations recently completed in the Far East and Australasia.

The Bureau also plans to continue its experiments in the physical handling of fresh fruits and vegetables in transit to overseas countries with a view to making an improvement in the methods of stowage and a reduction of the extensive loss incurred from deterioration while the fruit is on the steamers.

The Bureau of Crop Estimates places the total season's crop of apples for 1918 at 58,203,000 barrels and the commercial crop at 20,959,000 barrels. Nine per cent of the total crop and one-fourth of the commercial crop was placed in cold storage.



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